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Refinement of the Computerized Adaptive Screening Test

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The Computerized Adaptive Screening Test (CAST) is used for predicting performance on the Armed Forces Qualification Test (AFQT). The goal of this project is to expand the existing item pool, balance usage of the test items, improve score reporting, and allow the item pool to be updated periodically.

Existing items were reviewed, and new items were developed. Both new and existing items were administered to a sample of 20,000 newly enlisted soldiers and to another sample of 3,500 prospects. The results showed that (a) the new items had good psychometric properties, (b) a limited number of items were biased (and were eliminated), and (c) the test was valid overall, and fair for blacks and females.

A number of software enhancements were implemented. To prevent item overuse, the software was modified to prevent selection from a subset of initial items and to sample items organized into strata according to item difficulty. CAST will now produce test results that

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show probabilities of attaining scores in the AFQT category scores of 1-3A, 3B, or 4-5. Software implementations also included provisions for adding experimental items and collecting item calibration data.

FOREWORD

The Computerized Adaptive Screening Test (CAST) is the first widely used practical application of computerized adaptive testing. It is a component of the Joint Optimal Information Network (JOIN) system, a microcomputer-based aid to Army recruiters. CAST is a battery of two ASVAB subtests (word knowledge and arithmetic reasoning) and is used by recruiters to predict prospective recruits' subsequent Armed Forces Qualification Test (AFQT) performance.

CAST was developed for the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) by researchers at the Navy Personnel Research and Development Center using item banks and adaptive testing procedures developed in the early stages of the Joint Services CAT/ASVAB project.

Subsequent research by ARI staff has shown that CAST was both more accurate and more efficient for predicting AFQT scores than the Enlistment Screening Test, which is a much longer printed test for the same purpose.

However, ARI research also noted that CAST was not optimal for predicting critical AFQT categories. This was one of the major objectives of the refinement project. Other objectives were to expand the item bank, to screen items for race and sex bias, and to modify the computer software to improve item selection and scoring. The CAST Refinement Project was initiated to conduct this work. This report details the successful effort in developing new items, testing, screening, and calibrating items, and conducting research and simulations to test the effects of software modifications.

REFINEMENT OF THE COMPUTERIZED ADAPTIVE SCREENING TEST

EXECUTIVE SUMMARY

Requirement:

Prior research on the Computerized Adaptive Screening Test (CAST) has shown that the test was valid for predicting performance on the Armed Forces Qualification Test (AFQT). However, researchers and Army recruiters pointed out several shortcomings. First, the existing test item pool contained relatively difficult items and a limited number of word knowledge items. Moreover, these test items had never been reviewed for potential race and gender bias. Second, the test was susceptible to compromise because of overuse of some test items. Third, the presentation of test results made it difficult for recruiters to determine the likelihood that a prospect would qualify for enlistment or for special enlistment incentives. Finally, there was no provision in the software for the CAST item pool to be updated or revised easily.

Procedure:

The CAST Refinement Project was directed at overcoming these shortcomings. Existing CAST items were reviewed. Some were rewritten to eliminate potentially objectionable language. Duplicate items were identified and deleted. New items then were developed and pilot tested. Both new and existing items were administered to a sample of 20,000 newly enlisted soldiers (primary sample) and to another sample of 3,500 prospects (supplemental sample). The two samples provided data for item screening and calibration analyses.

A number of strategies were considered to reduce overexposure of certain items. Based on results in the research literature and on simulations, the software was modified to disallow selection of a subset of initial items and to sample items from strata that have been organized according to item difficulty. The software also was modified to produce test results that show probabilities of attaining AFQT category scores of 1-3A, 3B, or 4-5, and to administer additional items to examinees near category boundaries to increase the accuracy of the category estimates. (AFQT category estimates were based on the revised definition of AFQT to be implemented in October 1988.) Finally, changes were made to the software to permit insertion of new, unscored items and collection of calibration data on both new and existing items.

Findings:

The item development effort was successful in generating items with excellent discrimination values at critical difficulty levels. A small number of items that appeared to be biased against blacks or females were deleted from the item pool. The test as a whole again was shown to be a valid predictor of AFQT and fair to black and female examinees. The revised report of test results received favorable reviews from recruiters. Simulations of software modifications that had been designed to prevent overuse of particular items showed satisfactory results.

Utilization of Findings:

The expanded item pool and changes made to the CAST software with regard to item presentation and score reporting will enhance the operational use of CAST. The changes will continue to produce test results that are accurate and fair. Changes to the software will lessen the chance of compromises to test security, yield test reports that are more useful, and enable periodic maintenance and updating of the CAST item pool.

REFINEMENT OF THE COMPUTERIZED ADAPTIVE SCREENING TEST

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OVERVIEW

The Enlisted Screening Test

Each year, the military services test over a million prospects on the Armed Services Vocational Aptitude Battery (ASVAB) to identify those who are eligible for enlistment. The Armed Forces will accept only those individuals who obtain at least a minimum qualifying score on the Armed Forces Qualification Test (AFQT). The current AFQT score is based on four of the ASVAB subtests -- Word Knowledge (WK), Paragraph Comprehension (PC), Arithmetic Reasoning (AR), and Numerical Operations (NO). (Beginning October 1988, the Numerical Operations score will be replaced by the Math Knowledge score in the computation of AFQT.)

The military's testing costs each year are enormous. The ASVAB is a very lengthy test battery. It requires almost four hours to administer. To protect test security and ensure that the ASVAB is administered properly, ASVAB testing is conducted only at Military Entrance Processing Stations (MEPS) or by Mobile Examining Teams (MET) at designated sites. Test administration costs include administrator time, test facility costs, and test printing and scoring. In addition, lodging and meals must be provided for prospects who do not live within commuting distance of a MEPS or a MET site and who therefore must be lodged overnight prior to taking the test.

The military's concern about testing costs led the services to explore alternatives to testing all prospects on the ASVAB. Testing psychologists were directed to study the possibility of developing a new, short test that would correlate highly with AFQT and could be used to identify prospects with little or no chance of meeting minimum enlistment standards. This research led to development of the Enlistment Screening Test (EST) (Mathews & Ree, 1982). The test included items similar to the item types employed in the four ASVAB subtests used to compute AFQT. In a validation study, Mathews and Ree found that the EST correlated .83 with AFQT.

Mathews and Ree designed the EST so that it easily could be administered to prospects by recruiters in their recruiting stations. Total administration time for the EST is approximately 45 minutes. At test completion, the recruiter scores the test using a scoring stencil. This procedure yields a raw EST score. The recruiter then refers to a conversion table that provides an estimated AFQT percentile score corresponding to each possible raw score. The recruiter reviews the score with the prospect and counsels the prospect about the prospect's chances of qualifying for enlistment. Together they then determine whether it would be appropriate

for the prospect to travel to a MEPS or to a MET site for ASVAB testing.

The Computerized Adaptive Screening Test

Research demonstrated that the EST was a very accurate predictor of AFQT (Knapp & Pliske, 1986; Mathews & Ree, 1982). Nevertheless, there were a number of problems with the test that led to user dissatisfaction (Baker, Rafacz & Sands, 1984). First, many recruiters felt that the test took too long to administer. They desired a test that required less than 45 minutes of administration time. Second, the test placed a large clerical burden on recruiters. They were required to hand score the test to derive an EST raw score, then use a conversion table to obtain an estimated AFQT percentile score from the raw score. There were many opportunities for scoring errors, and these clerical tasks frequently required a heavy investment of recruiter time. Finally, there were concerns about test security. There were only two alternate forms of the EST, and the test was being administered to hundreds of thousands of prospects each year. It seemed highly probable that the security of many test items would be jeopardized in a very short time.

These problems led researchers to explore alternatives to the EST. One of these alternatives was a computerized adaptive version of the test. Ongoing research by the military (e.g., McBride, 1979) suggested that computerized adaptive testing was a practical alternative to conventional paper-and-pencil testing. It also appeared that a computer-administered test would help solve the serious test administration, clerical, and test security problems that threatened the usefulness of EST.

Researchers at the Navy Personnel Research and Development Center (NPRDC) and at the Army Research Institute (ARI) assumed primary responsibility for developing this new test, which was called the Computerized Adaptive Screening Test (CAST). On the basis of research by Moreno, Wetzel, McBride, and Weiss (1984), Sands and McBride concluded that AFQT scores could be predicted efficiently and accurately from a short adaptive battery comprised of just two subtests, Word Knowledge (WK) and Arithmetic Reasoning (AR). The initial version of these subtests used item banks and adaptive testing procedures developed by Weiss and McBride, respectively, as part of a joint services project exploring the feasibility of a computerized adaptive version of the ASVAB (CAT/ASVAB).

Sands and Gade (1983) conducted the first CAST validation study using Army recruits at the Los Angeles MEPS. As part of their research, Sands and Gade investigated an optimal length for each of the two subtests. They found that a test comprised

of 10 WK items and five AR items correlated .85 with AFQT. This compared favorably with the correlation of .83 between EST and AFQT reported by Mathews and Ree (1982).

Subsequent validation research replicated and extended the work of Sands and Gade (Knapp & Pliske, 1986; Pliske, Gade & Johnson, 1984). This research established that CAST was both more accurate and more efficient than EST for predicting AFQT scores. CAST was less than half the length of the EST, yet it correlated slightly more highly than EST with AFQT percentile scores.

In a report discussing their research, Sands and Gade (1983) also described the development of computer programs to implement CAST on the Joint Optimal Information Network (JOIN) system, a microcomputer-based aid to Army recruiters. These programs enable Army recruiters to administer CAST in their recruiting stations. The test requires approximately 15 minutes for prospects to complete. At the end of testing, CAST automatically computes WK and AR scores and estimates an AFQT percentile score. Thus, CAST relieves recruiters of the test administration and clerical burdens imposed by the EST. Moreover, because CAST is an adaptive test, different examinees receive different items, reducing the possibility that the security of the test will be compromised.

CAST quickly became an important tool for recruiters and the first widely used practical application of computerized adaptive testing. Recruiters use CAST to identify prospects who are likely to qualify for enlistment and target these individuals for their recruiting efforts. Recruiters also use CAST to identify prospects who are unlikely to qualify for enlistment and provide these individuals with a realistic assessment of their chance of being allowed to enlist.

Shortcomings of CAST

Research on CAST demonstrated that the test clearly achieved its original objectives. However, this research and discussions with Army recruiters also suggested ways that the test could be improved.

Limited item pool. The current CAST item pool contains a limited number of items at key difficulty levels. There are only 78 WK items in the item pool. Thus, there is a shortage of WK items throughout the difficulty range. There are 225 AR items, but very few of these are easy items. As a result, it is not always possible to find an item of appropriate difficulty to administer to examinees who are obtaining relatively low scores on the AR subtest. This makes it difficult to distinguish between examinees from AFQT categories 3B and 4 and between examinees from AFQT categories

4 and 5. These distinctions are very important to recruiters who are attempting to determine whether a prospect is likely to be eligible for Army enlistment.

Overexposure of some test items. A second shortcoming of CAST is that it is susceptible to compromise because of the disproportionately heavy use of a small number of test items. Because of the item selection strategy that is used for the test, many of the highly discriminating items in the middle of the difficulty range are administered to a very high percentage of examinees. The easiest test items, the most difficult test items, and the items of "medium" difficulty that have only moderate discriminating power are seldom or never used. As a result, it would be relatively easy to compromise the security of the test by coaching examinees on a small number of the most frequently used test items.

Interpretation and use of test results. A third shortcoming of CAST is that the AFQT score estimates provided by the computer program are difficult for recruiters to interpret and use. CAST reports a predicted AFQT percentile score. Most recruiters are much more interested in a prospect's AFQT category.

Each AFQT category consists of a range of AFQT percentile scores, as shown in Table 1. AFQT category scores are used to determine whether prospects are eligible for enlistment. By law, the Armed Forces are not allowed to accept any recruits with AFQT category scores of 5. In addition, depending on the quality of the prospects applying for enlistment, the services may raise or lower their minimum enlistment standards. AFQT category scores also are used to determine eligibility for enlistment bonuses. Generally, prospects with AFQT category scores of 3A or better are eligible for bonuses and special recruiting incentives. These prospects also are more likely to be eligible for enlistment in technical Military Occupational Specialties (MOS) that attract many recruits to the military.

Table 1

Relationship between AFQT Categories and AFQT Percentile Scores

AFQT Category	Range of AFQT Percentiles
1	93 - 99
2	65 - 92
3A	50 - 64
3B	31 - 49
4A	21 - 30
4B	16 - 20
4C	10 - 15
5	1 - 9

To a recruiter, an AFQT percentile score estimate is not as useful as an estimate of the probability that a prospect will receive an AFQT <u>category score</u> of 1 - 3A, 3B, 4, or 5. The probability estimates of AFQT category scores allow the recruiter to counsel prospects about their chances for qualifying for enlistment, for enlistment bonuses, and for enlistment in technical MOS. The probability estimates also help recruiters identify outstanding prospects, so that they can focus their attention on recruiting these individuals for the Army.

When the initial development work on CAST took place, researchers focused on maximizing the accuracy of the AFQT percentile score estimates provided by the test. Knapp and Pliske (1985) noted that the item selection and scoring procedures built into the CAST program were not optimal for predicting AFQT <u>category scores</u> from CAST.

This suggests that two changes in CAST are needed to maximize the interpretability and usability of CAST test scores:

- reporting probability estimates for AFQT <u>category scores</u> instead of an estimated AFQT percentile score

- changing the item selection strategy and test scoring procedures to maximize the accuracy of probability estimates of AFQT <u>category scores</u> instead of the accuracy of the AFQT percentile score estimate.

Revision of item pool. A fourth shortcoming of CAST is that there is no provision for revising the CAST item pool on an ongoing basis. The CAST software does not save examinees' item responses or test scores. Nor does it provide a means for administering unscored experimental items that could later replace or augment the items in the present CAST item pool. As a consequence, introducing new items for CAST requires an expensive and time-consuming item development and data collection effort.

Objectives of the CAST Refinement Project

The general goal of the CAST Refinement Project was to remedy the four shortcomings described above. More specifically, the objectives of the project were:

- to review current CAST items and add new items to the item pool
  - -- to achieve a better balance of item difficulties
  - -- to improve discrimination at key points on the AFQT continuum
  - -- to calibrate new items and check the calibration of existing items
  - -- to check new and existing items for any race or gender bias

- to revise the CAST software
  - -- to reduce overuse of items
  - -- to improve the accuracy of AFQT category predictions
  - -- to improve the reporting of results to recruiters
  - -- to allow for collection of data on experimental items.

Organization of This Report

This report describes the results of the CAST Refinement Project. In the next section, we discuss the development, screening, and calibration of new items. Following that is a section that describes the revision of the CAST software. Finally, we discuss opportunities for future research to further enhance CAST.

ITEM DEVELOPMENT, SCREENING, AND CALIBRATION

Development of New CAST Items and Review of Existing Items

One of the goals of the CAST Refinement Project was to ensure an adequate number of items for both the Arithmetic Reasoning (AR) and Word Knowledge (WK) subtests. At the start of the project, there were 225 AR items and 78 WK items. It was originally proposed to expand the item pools to 300 items each. However, after careful consideration of the tradeoffs between having a large number of items versus having increased calibration accuracy by maximizing the number of examinees per item, we decided on a target of 250 items for each subtest. We estimated that 275 AR items and 275 WK items would provide an adequate item base from which to draw the target number of items, which meant that we needed to develop 50 new AR items and 197 new WK items.

Item Development

Arithmetic Reasoning items. The AR items used in the ASVAB and in CAST are arithmetic word problems. An example AR item is shown in Figure 1.

AR items can be classified according to the algebraic relations that the examinee is required to solve. Seven different types of algebraic relations were identified. Table 2 shows the number and percent of AR items for each type of relation. For example, the table shows that about 50% of existing AR items require simple addition, subtraction, multiplication, or division. Fifty new items were developed to parallel the distribution of the existing items on the item types.

If 4 peaches cost a quarter, 20 peaches will cost:

A) $0.75

B) $1.00

C) $1.20

D) $1.25

E) $1.50

Figure 1. Arithmetic Reasoning Item Format

Table 2

Classifications of AR Items

Classification	Current Items Frequency	Current Items Percent	New Items Frequency	New Items Percent
Algebra "1 step" (a+b=x)	114	50.7	32	64.0
Algebra "2 step" (a+x=b)	18	8.0	3	6.0
Percent (a% of b=x)	38	16.9	8	16.0
Ratio (a/b=x/c)	25	11.1	5	10.0
Distance & time conversion	20	8.9	0	0.0
Areas, Volume	7	3.1	2	4.0
Simultaneous Equations	3	1.3	0	0.0

Table 3 shows the difficulty level (expressed in terms of "b" values) of the existing AR items. The distribution of difficulty for existing AR items was skewed towards the difficult end. This was a problem because our greatest concern is making distinctions among examinees in the middle and lower half of the ability distribution (e.g., at the 30th and 50th percentiles of ability). Therefore, we tried to develop relatively easy items for the 50 new AR items. We also tried to ensure that the new items did not resemble any existing CAST items or any AR items from operational or old versions of the ASVAB. Before items were administered to any examinees, AIR and ARI staff who have extensive background in item development reviewed the items to ensure that they did not contain language that might be offensive or unfair to any group of potential examinees.

Table 3

Difficulties of Current AR Items

Difficulty Range ("b" values)	Frequency	Percent	Cumulative Percent
-2.00 to -1.51	0	0	0
-1.50 to -1.01	5	2.2	2.2
-1.00 to -0.51	22	9.8	12.0
-0.50 to 0.00	21	9.3	21.3
0.01 to 0.50	43	19.1	40.4
0.51 to 1.00	65	28.9	69.3
1.01 to 1.50	41	18.2	87.6
1.51 to 2.00	28	12.4	100.0

Word Knowledge items. Three different item formats were used to present the existing 78 CAST WK items. An example of each item format and the number of items cast in each format are shown in Figure 2. The majority of existing WK items are "fill in" items, but there also are significant numbers of "synonyms" and "underlines." All new WK items followed the "underline" format that is currently used in the ASVAB. This format was preferable for testing an examinee's understanding of the meaning of words because it allows words to be presented in context.

1. Fill-ins (n=50)

We had to hurry because we were ________.

A) angry
B) confused
C) late
D) clumsy
E) lucky

2. Synonyms (n=12)

The word that means the same as small is:

A) sturdy
B) round
C) cheap
D) little
E) wide

3. Underlines (n=16)

The computer did not function yesterday.

A) finish
B) stop
C) operate
D) overheat
E) arrive

Figure 2. Current WK Item Formats

Table 4 shows the difficulties (percent correct) of the existing WK items. The distribution of difficulties was skewed towards the "easy" end. This was ideal because we were most interested in discriminating among examinees in the middle and lower portion of the ability distribution. We therefore attempted to match the difficulty distribution of our new WK items to the distribution of the existing items.

We used word frequency to guide us in our development of new items. Our analyses of existing WK items showed that item difficulty correlated .28 with word frequency. Therefore, we tried to match the word frequency distribution of the new items

to that of the existing items (see Table 5).

In developing the new items, several rules were followed. First, it was required that the word frequency of the underlined "stem" word was less than or equal to the word frequency of the correct response. Second, all stems and correct responses used in CAST were different from stems used in previous or operational versions of the ASVAB and in test preparation books such as Barron's. We also verified that the stems and correct responses were not used in existing CAST items either as stems or correct responses. Finally, all new and revised WK items were subjected to a sensitivity review by AIR and ARI staff.

Table 4

Difficulties of Current WK Items

Difficulty Range ("b" values)	Frequency	Percent	Cumulative Percent
-2.00 to -1.51	14	17.9	17.9
-1.50 to -1.01	11	14.1	32.1
-1.00 to -0.51	14	17.9	50.0
-0.50 to -0.00	10	12.8	62.8
0.01 to 0.50	9	11.5	74.4
0.51 to 1.00	9	11.5	85.9
1.01 to 1.50	4	5.1	91.0
1.51 to 2.00	7	9.0	100.0

Table 5

Word Frequencies of WK Items

Word Frequency Range*	Current Items Frequency	Current Items Percent	New Items Frequency	New Items Percent
50.0 and above	14	17.9	10	5.1
47.5 to 49.9	3	3.8	18	9.1
45.0 to 47.4	6	7.7	23	11.7
42.5 to 44.9	11	14.1	26	13.2
40.0 to 42.4	11	14.1	20	10.2
37.5 to 39.9	14	17.9	28	14.2
35.0 to 37.4	6	7.7	23	11.7
32.5 to 34.9	4	5.1	17	8.6
30.0 to 32.4	5	6.4	32	16.2
Less than 30.0	4	5.1	0	0.0

* Standard Frequency Index according to the American Heritage Word Frequency Book.

Pilot Test

All new items were submitted to a pilot test prior to the primary and supplemental data collection. Examinees were 73 soldiers in Advanced Individual Training at Fort Belvoir, Virginia. They were drawn from two repair MOS, 52C and 52D. Each examinee completed 104 WK items and 28 AR items. Table 6 shows the AFQT category distribution for the two MOS. The majority of the incumbents were from AFQT categories 2, 3A, and 3B.

Table 6

AFQT Categories for Utility Equipment Repairer (52C) and Power Generator Equipment Repairer (52D)

AFQT Category	Frequency	Percent	Cumulative Percent
1	4	0.8	0.8
2	153	28.9	29.7
3A	130	24.6	54.3
3B	171	32.3	86.6
4A	57	10.8	97.4
4B	7	1.3	98.7
4C	3	.6	99.2
5	4	.8	100.0

Data analyses were conducted to investigate the difficulty of the new items, their item-total biserial correlations, and the average time required to complete an AR item or a WK item. For the AR items, the mean p-value was .64. The mean item-total biserial correlation was in excess of .40. The mean p-value for the WK items was .76, indicating that WK items were somewhat easier than the AR items for this sample. The mean item-total biserial correlation was .30. The correlation between word frequency and p-value was .28.

Completion times for the AR and WK items are summarized in Table 7. The average time to complete each WK item was 10.0 seconds. Ninety percent of the examinees averaged 13.25 seconds or less. Comparable completion times for the AR test items were 66.7 and 83.5 seconds, respectively.

As a result of the item analyses and comments made by the pilot test examinees, several revisions were made to the items and to the test administration instructions.

Table 7

Pilot Testing Completion Times for AR and WK Items

Subtest	Minutes to Complete	Frequency	Percent	Cumulative Percent
AR*	Under 15	2	2.9	2.9
	15 to 19	2	2.9	5.8
	20 to 24	6	8.7	14.5
	25 to 29	23	33.3	47.8
	30 to 34	25	21.7	69.6
	35 to 39	15	21.7	91.3
	40 to 44	4	5.8	97.1
	Never Finished	2	2.9	100.0
WK*	Under 10	1	1.4	1.4
	10 to 14	15	21.7	23.2
	15 to 19	34	49.2	72.5
	20 to 24	13	18.8	91.3
	25 and over	6	8.7	100.0

* times for four cases were unavailable

Review of Existing Items

A review of existing CAST items revealed a number of problems. Several miskeyed and duplicate or near-duplicate items were identified. In addition, the distractors on a few items were the same as the stem or the correct response on other items. These problems were corrected.

In addition, the number of response options was also standardized. Some of the existing CAST items had four response options, while others had five. A fifth response option was added to all items with four options.

Finally, the existing items were submitted to a review for sensitivity and clarity. A number of "sensitive" items were identified and rewritten. Many of these items referred to men in traditional male roles or women in factory or clerical jobs. Any existing fill-in-the-blank items that were ambiguous were clarified to ensure that only one response option could be the correct answer.

Item Tryout Data Collection

Two data collections were conducted to provide calibration data for new and existing CAST items. The primary sample consisted of soldiers who were completing their first week in the Army. They were given a paper-and-pencil test that included 50 WK items and 50 AR items. Because these examinees already had been screened on the ASVAB and accepted for enlistment in the Army, they represented a restricted sample with few low ability examinees.

Additional calibration data were collected from a second sample, which was designated the supplemental sample. Unlike the primary sample, the supplemental sample consisted of prospects rather than enlistees. These prospects were not screened for ability prior to CAST testing. Thus, the supplemental sample included individuals who did not meet minimum ability qualifications for enlistment. The supplemental sample data were important because CAST is designed to identify prospects who do not meet minimum ability qualifications for enlistment, and the supplemental sample was the only means of determining how low ability individuals would respond to CAST items.

In the remainder of this section, we describe the data collection design and the actual sample obtained for each of the two data collections.

Primary Calibration Sample

Data collection design. The goal was to collect sufficient data to permit separate calibration of item parameters for blacks and whites and for males and females. Approximately 700 - 800 responses per item are required to obtain stable item parameter estimates.

We were constrained to approximately 90 minutes of testing time at each site. Using the data from the pilot test, we determined that examinees could complete 50 WK items and 50 AR items within that time. We created six AR and six WK test forms of this length. Each test form consisted of 50 items, including 45 unique items and 5 anchor items that were common across all six forms of that subtest. Items were assigned to each test form using a stratified random design to balance the number of new and current items, item difficulty, and item discrimination. A reversed version of each form also was generated so that we could investigate the effects of item position on test results.

Given six test forms and our goals of 700 - 800 examinees per item for each subgroup, we established target sample

sizes of 4,800 black, white, male, and female examinees per item. We reviewed accessions flows through the eight Army reception battalions for FY 87 (i.e., one year prior to the time we planned to conduct our data collection) to determine the most efficient strategy for obtaining these examinees. We found that if we collected data at five reception battalions for portions of Fall 1987 and Winter 1988, as shown in Table 8, we would minimize the number of data collection months required to meet our sample size targets.

Table 8

Primary Sample: Testing Plans

Reception Battalion	Test Dates	Expected Flow*			Testing Goals		
		Total	Blacks	Females	Total	Blacks	Females
Ft. Dix	Nov-Feb	9,837	2,326	2,991	6,600	1,561	2,007
Ft. Jackson	Jan-Feb	6,012	1,711	2,207	4,000	1,138	1,468
Ft. McClellan	Nov-Jan	3,536	755	1,222	2,400	512	829
Ft. Sill	Oct-Dec	4,567	1,271	1	3,000	835	1
Ft. L. Wood	Oct-Dec	7,785	1,463	7	5,200	977	5
Total		31,737	7,526	6,428	21,200	5,023	4,310

* Based on FY 87 accessions flow.

At each site, booklets were administered to examinees in serial order (i.e., Form 1 was administered to the first examinee, Form 2 was administered to the second examinee, etc.). All examinees completed their WK test first, followed by their AR test. A total of 18 minutes was allotted for the WK test, while 62 minutes were set aside for AR testing.

Sample obtained. Table 9 shows total and subgroup testing goals and the actual sample obtained. The target sample goals were met for the total sample and blacks, while the target for females fell somewhat short. On average, each test item was administered to 3,855 examinees, including 881 blacks and 704

females. Although the female sample fell somewhat short of our goals, the subgroup samples were sufficiently large to obtain separate item parameter estimates for each subgroup.

Tables 10 and 11 show the distribution of test forms by reception battalion for AR and WK forms, respectively. The frequency for each form number includes examinees tested on either the forward or the reverse versions of the form. These frequencies show that the distribution of tests (and therefore items) was balanced across sites.

Table 9

Primary Sample: Sample Obtained

Reception Battalion	Test Dates	Sample Obtained		
		Total	Blacks	Females
Ft. Dix	Nov-Feb	5,739	1,636	2,032
Ft. Jackson	Jan-Feb	3,207	1,026	1,302
Ft. McClellan	Nov-Jan	2,973	606	880
Ft. Sill	Oct-Dec	3,139	896	3
Ft. L. Wood	Oct-Dec	4,948	1,122	7
Total		20,037	5,286	4,224

Supplemental Calibration Sample

Examinee requirements. There were two goals to the supplemental data collection. The first was to provide accurate estimates of item parameters for relatively easy CAST items. This was important because we were concerned that some CAST items would be too easy for the examinees in the primary sample; virtually none of the examinees would respond incorrectly, making it impossible to obtain accurate item parameter estimates. We believed that we could remedy this problem by administering these items to a sample of prospects that included a number of low ability examinees, some of whom would be unable to answer the item correctly. The second goal was to assess the effects of test administration

mode on item parameter estimates. This was important because CAST is administered via computer, and we were uncertain whether the item parameter estimates obtained from paper-and-pencil testing of the primary sample would generalize to a computer administration mode.

Table 10

AR Forms Administered at Each Reception Battalion

AR Form	Reception Battalion						TOTAL
	Unknown	Dix	Jackson	McClellan	Sill	L. Wood	
A01	11	1033	519	504	530	827	3424
A02	12	1002	528	506	533	826	3407
A03	8	934	535	492	528	825	3322
A04	9	978	546	499	525	825	3382
A05	7	913	547	486	520	826	3299
A06	5	885	532	488	507	819	3236
TOTAL	52	5745	3207	2975	3143	4948	20070

Table 11

WK Forms Administered at Each Reception Battalion

WK Form	Reception Battalion						TOTAL
	Unknown	Dix	Jackson	McClellan	Sill	L. Wood	
W01	12	989	529	505	535	824	3394
W02	13	1016	518	494	527	827	3395
W03	12	900	536	492	527	821	3288
W04	11	1006	542	500	516	832	3407
W05	7	922	547	493	525	831	3325
W06	11	906	535	488	509	813	3262
TOTAL	66	5739	3207	2972	3139	4948	20071

There were no plans to duplicate subgroup analyses for the supplemental sample data because such comparisons will be addressed in the analyses of the primary sample. Therefore, our sampling goal for the supplemental sample was to collect data from approximately 600 examinees per item.

The data were collected during CAST testing of prospects in recruiting stations, using a special version of the CAST software. This software enabled us to administer a set of experimental, unscored WK and AR items to each examinee completing the operational CAST. The data from both the experimental items and the operational CAST items were stored on a special data diskette. At the end of each month, recruiters mailed these diskettes to us for processing.

Officials from the U.S. Army Recruiting Command (USAREC) worked with us to determine the details of the data collection plan. USAREC agreed to provide up to 10 minutes of additional testing time for prospects to complete the CAST experimental items. USAREC also asked us to keep testing time to a minimum for high ability prospects so that recruiters could spend as much time as possible recruiting these individuals.

The testing time data available to us suggested that, on average, examinees could complete six items of each type in approximately seven minutes. We decided that this would be the number of items we would administer to most examinees. However, we decided to administer nine unscored items of each type to "low" ability examinees (i.e., examinees with estimated AFQT percentile scores of 35 or lower). We wanted these extra data because no data from low ability examinees were available from the primary sample. Even with these extra items, we determined that most examinees would be able to complete the experimental items in 10 minutes.

Next, we estimated our total examinee requirements for the supplemental sample. Assuming that 60% of the sample completed six WK and six AR items, while 40% completed nine items from each subtest, we determined that we would need almost 23,000 examinees to obtain data from 600 examinees per item for all 275 WK items and 275 AR items. After consulting with USAREC, we concluded that this was not realistic. Instead, we decided to sample 96 WK items and 96 AR items from the item pool and collect supplemental sample data only for these items. In choosing these items, we oversampled new items and those items that we expected would be relatively "easy." These procedures reduced our total examinee requirements from 23,000 to 8,000.

The next step was to select the recruiting stations where we would collect the supplemental sample data. We were not able to determine the number of examinees tested on CAST each month at each recruiting station. However, results from a previous project suggested that, on average, recruiting stations test approximately 20 prospects per month on CAST (Knapp & Pliske, 1985). Therefore, we believed we would be able to meet our examinee requirements by conducting supplemental testing for four months at 100 recruiting stations.

In total, the Army has 55 recruiting battalions. We sampled 20 of these 55 battalions to participate in the supplemental testing. The sample was stratified by region of the country. We oversampled battalions with high percentages of black and Hispanic recruits. Within each battalion, we sampled five recruiting stations. This sample was chosen by (a) eliminating all stations with only one recruiter; (b) making the probability of choosing a station proportional to the number of recruiters in that station; and (c) selecting "matched" recruiting stations for the eight stations that were unable to participate in the study.

The special CAST software that was developed for supplemental sample testing embedded the experimental items within the operational CAST, so examinees had no way of

knowing that they were receiving experimental items. All examinees completed the WK test first. Two sets of three experimental items were administered during the course of testing. The software also estimated each examinee's AFQT percentile score following the seventh operational WK item. If the estimated score was 35 or lower, three additional experimental items were also administered in order to maximize the sampling of lower ability responses. Similar procedures were used to seed experimental items in the AR test.

The experimental items were administered in serial order across examinees, ensuring that all experimental items were administered to approximately the same number of examinees. In addition, controls were built into the software to ensure that no item was administered to an examinee as both an operational item and an experimental item.

Sample obtained. During the course of the supplemental data collection, the services conducted an Initial Operational Test and Evaluation (IOT&E) of new ASVAB test forms. To ensure that sufficient numbers of low ability examinees participated in this IOT&E, the services temporarily suspended the use of the CAST and EST pre-screening tests. Confusion over the start-stop-start dates and the limited recovery time caused the supplemental data collection to fall far short of its sample size goals. The total sample was approximately 3,968 examinees, which was less than half of the 8,000 examinees we had hoped to test. The number of examinees per item averaged 290 for WK and 310 for AR, compared to our goal of 600 examinees per item.

AFQT scores were available for only 796 of the 3,968 supplemental sample examinees (20%). No AFQT scores were available for the remaining 3,172 supplemental sample examinees, either because they did not take the ASVAB (e.g., they were screened out by CAST, they decided they no longer were interested in enlisting) or because their ASVAB scores had not yet been processed. Table 12 shows the distribution of AFQT category scores for primary and supplemental sample examinees with AFQT data. The supplemental sample included a much larger proportion of low ability examinees. Twenty-eight percent of the supplemental sample examinees fell below the 31st percentile on AFQT. In contrast, only 6% of the primary sample scored below the 31st percentile on AFQT.

Table 12

AFQT Category Scores for Primary and Supplemental Sample Examinees

AFQT Category	Primary	Supplem.	TOTAL
Missing	2,004	3,272	5,176
1	758	24	782
2	5,850	176	6,026
3A	4,837	122	4,959
3B	5,238	251	5,489
4A	1,047	113	1,160
4B	3	61	64
4C	0	28	28
5	1	21	22
TOTAL	19,738	3,968	23,706

Primary Sample Item Analysis and Screening

As noted previously, a total of 275 Arithmetic Reasoning (AR) items and 275 Word Knowledge (WK) items, including 50 new AR items and 197 new WK items, were administered to examinees in the primary sample. The items for each subtest were divided into six paper-and-pencil forms containing 50 items each, including 45 unique items and 5 anchor items that were common across forms. An alternate version, in which the same items were presented in a reverse order, was created for each form. Each version of each of the six forms of the AR and WK subtests was completed by approximately 1600 subjects.

In this section of the report, we describe the analyses of the primary sample data. We begin with a description of item analysis and screening issues. This is followed by a discussion of item calibration results.

Item Analysis and Screening Issues

The primary sample data were used to address a number of different item analysis and screening issues. For this discussion, we have grouped these issues into two categories:

- item position effects, including the comparability of the forward and reverse versions of each form

- psychometric issues.

Item position effects. In his research on the Medical College Admissions Test, Wise (1986) found that item difficulty was related to item position within the test. Administration of forward and reverse versions of each AR and WK form provided us with a means to assess position effects for CAST items.

As a first step in these analyses, several different item statistics were computed for each AR and WK item for both the forward and reverse versions of each form. These statistics included percent correct (p), the Clemans-Brogden biserial correlation (r) (which adjusts for deviations from normality in the total scores), and IRT estimates of the a, b, and c parameters obtained from both the BILOG and LOGIST programs. In addition, we computed a chi-square index to assess race and sex bias. This bias index is based on the assumption that, within any given ability level, the proportion of blacks and whites (or males and females) passing an item should be equal. To compute the bias index, we divided the total ability distribution into equal fifths. For each level, we computed a signed chi-square to assess any differences in passing rates between blacks and whites (or males and females). A positive chi-square denotes that the

percentage of blacks passing the item is greater than the percentage of whites (or the percentage of females passing the item is greater than the percentage of males). We then aggregated the chi-square values across the five ability levels. The resulting bias index is distributed as chi-square with five degrees of freedom. All item statistics are reported in Appendix B. It should be noted that, except for the LOGIST parameter estimates, "not reached" items were treated as if they were not presented when computing all item statistics. For the LOGIST estimates, the "not reached" items were treated as incorrect.

We were interested in assessing systematic effects of item position on item statistics and item parameter estimates, as well as the comparability of item statistics and item parameter estimates across the forward and reverse versions of each form.

To assess the effects of item position, we computed the difference between item statistics or item parameters across the two versions (i.e., forward minus reverse) and correlated this difference with item position on the reverse form. The results of these analyses are presented in Table 13.

Table 13

CAST Primary Sample Correlation of Item Statistic Difference with Item Position (n=550 items)

	ITEMPOS	PDIF	BISDIF	ABIDIF	BBIDIF	CBIDIF	ALGDIF	BLGDIF	CLGDIF	RCHDIF	SCHDIF
ITEMPOS	1.00000	0.66562	-0.20192	-0.47456	-0.63628	0.00367	-0.53333	-0.51236	0.12709	0.15625	0.34332
PDIF	0.66562	1.00000	0.02232	-0.34586	-0.82532	-0.03735	-0.40363	-0.64007	-0.02721	0.04257	0.24099
BISDIF	-0.20192	0.02232	1.00000	0.13309	0.08773	-0.45154	0.16565	0.15175	-0.28270	0.03667	-0.09104
ABIDIF	-0.47456	-0.34586	0.13309	1.00000	0.39625	0.27998	0.86800	0.27729	0.22529	-0.08647	-0.10848
BBIDIF	-0.63628	-0.82532	0.08773	0.39625	1.00000	0.23290	0.49832	0.72360	0.18655	-0.07977	-0.25831
CBIDIF	0.00367	-0.03735	-0.45154	0.27998	0.23290	1.00000	0.24473	0.13973	0.63321	-0.03750	0.01685
ALGDIF	-0.53333	-0.40363	0.16565	0.86800	0.49832	0.24473	1.00000	0.30518	0.36210	-0.08361	-0.14914
BLGDIF	-0.51236	-0.64007	0.15175	0.27729	0.72360	0.13973	0.30518	1.00000	0.17609	-0.05496	-0.16977
CLGDIF	0.12709	-0.02721	-0.28270	0.22529	0.18655	0.63321	0.36210	0.17609	1.00000	0.03066	0.08717
RCHDIF	0.15625	0.04257	0.03667	-0.08647	-0.07977	-0.03750	-0.08361	-0.05496	0.03066	1.00000	0.18324
SCHDIF	0.34332	0.24099	-0.09104	-0.10848	-0.25831	0.01685	-0.14914	-0.16977	0.08717	0.18324	1.00000

Note: DIF suffix indicates difference of statistic of forward minus reversed

There was a correlation of .67 between the difference in *p* and item position. This correlation means that items appearing early in the subtest tend to be easier than later ones. Similar correlations also were obtained for the differences in the BILOG and LOGIST *b* estimates and item position (-.64 and -.51, respectively). These results suggest that fatigue may increase the difficulty of test items during the course of the test.

The difference in biserial *r*'s correlated -.20 with item position, while the differences in the BILOG and LOGIST estimates of *a* correlated -.47 and -.53 with item position, respectively, indicating that item discrimination increased during the course of testing. This suggests that fatigue may be a greater problem for individuals of lesser ability, causing them to miss more items during the course of the subtest, thus making the final items on the subtest more discriminating than the initial items.

Finally, there was a positive correlation between the differences in the bias indices and item position (.16 for race and .34 for sex). This means that the final items on the subtest are somewhat more likely than the initial items to favor the majority group.

Another way we analyzed item position effects was by averaging the differences between item statistics and item parameters across all six forms (forward minus reverse form), then correlating these mean differences with item position on the reverse form. These correlations shown in Table 14 are thus based on fifty observations (means at each fifty position). We also ran a similar analysis where we averaged the item statistics differences over five item positions, thus yielding ten data points for the correlations with item position. These correlations are reported in Table 15. Both tables show that later items were more difficult, more discriminating, and slightly more biased against blacks and females than initial items.

Table 14

CAST Primary Sample - Arithmetic Reasoning and Word Knowledge Items
Correlation of Mean Item Statistic Difference by Position with Item Position (based on 50 item positions)

	ITEMPOS	PDF	BISDF	ABIDF	BBIDF	CBIDF	ALGDF	BLGDF	CLGDF	RCHDF	SCHDF
ITEMPOS	1.00000	0.95500	-0.52744	-0.89665	-0.95375	0.64746	-0.88946	-0.91038	0.44218	0.38739	0.82676
PDF	0.95500	1.00000	-0.53593	-0.85081	-0.97416	0.63086	-0.83821	-0.91940	0.44337	0.39213	0.77883
BISDF	-0.52744	-0.53593	1.00000	0.54545	0.55517	-0.42056	0.57479	0.58623	-0.09470	0.12851	-0.33741
ABIDF	-0.89665	-0.85081	0.54545	1.00000	0.89081	-0.47246	0.98669	0.85723	-0.23464	-0.29378	-0.71259
BBIDF	-0.95375	-0.97416	0.55517	0.89081	1.00000	-0.52683	0.88756	0.92825	-0.34325	-0.35261	-0.78777
CBIDF	0.64746	0.63086	-0.42056	-0.47246	-0.52683	1.00000	-0.46405	-0.53992	0.70631	0.33883	0.56929
ALGDF	-0.88946	-0.83821	0.57479	0.98669	0.88756	-0.46405	1.00000	0.84155	-0.16764	-0.27104	-0.69505
BLGDF	-0.91038	-0.91940	0.58623	0.85723	0.92825	-0.53992	0.84155	1.00000	-0.30106	-0.33812	-0.72364
CLGDF	0.44218	0.44337	-0.09470	-0.23464	-0.34325	0.70631	-0.16764	-0.30106	1.00000	0.33605	0.43885
RCHDF	0.38739	0.39213	0.12851	-0.29378	-0.35261	0.33883	-0.27104	-0.33812	0.33605	1.00000	0.41640
SCHDF	0.82676	0.77883	-0.33741	-0.71259	-0.78777	0.56929	-0.69505	-0.72364	0.43885	0.41640	1.00000

Table 15

CAST Primary Sample - Arithmetic Reasoning and Word Knowledge Items
Correlation of Mean Item Statistic Difference by Position with Item Position (based on means of 5-item groups)

	NEWPOS	PDF	BISDF	ABIDF	BBIDF	CBIDF	ALGDF	BLGDF	CLGDF	RCHDF	SCHDF
NEWPOS	1.00000	0.99363	-0.87774	-0.97366	-0.99559	0.90435	-0.96853	-0.98534	0.67805	0.70804	0.94729
PDF	0.99363	1.00000	-0.87995	-0.96212	-0.99683	0.88444	-0.95432	-0.98520	0.68069	0.65828	0.92598
BISDF	-0.87774	-0.87995	1.00000	0.89265	0.86854	-0.73630	0.90336	0.89936	-0.42419	-0.41344	-0.75050
ABIDF	-0.97366	-0.96212	0.89265	1.00000	0.97484	-0.83832	0.99732	0.96173	-0.54049	-0.62134	-0.90085
BBIDF	-0.99559	-0.99683	0.86854	0.97484	1.00000	-0.88081	0.96744	0.98431	-0.67101	-0.66587	-0.92907
CBIDF	0.90435	0.88444	-0.73630	-0.83832	-0.88081	1.00000	-0.83186	-0.91676	0.74300	0.81259	0.87759
ALGDF	-0.96853	-0.95432	0.90336	0.99732	0.96744	-0.83186	1.00000	0.95543	-0.51098	-0.62254	-0.88629
BLGDF	-0.98534	-0.98520	0.89936	0.96173	0.98431	-0.91676	0.95543	1.00000	-0.66781	-0.63159	-0.90056
CLGDF	0.67805	0.68069	-0.42419	-0.54049	-0.67101	0.74300	-0.51098	-0.66781	1.00000	0.70027	0.75794
RCHDF	0.70804	0.65828	-0.41344	-0.62134	-0.66587	0.81259	-0.62254	-0.63159	0.70027	1.00000	0.81691
SCHDF	0.94729	0.92598	-0.75050	-0.90085	-0.92907	0.87759	-0.88629	-0.90056	0.75794	0.81691	1.00000

Tables 16 and 17 show these same correlations for each subtest. The most important difference between the two subtests is the relationship between item discrimination and item position. For the AR subtest, the correlation between differences in r and item position indicates that initial items were more discriminating than final items. This may be because lower ability examinees did not reach the final items on the AR subtest, so their data were not available for computing r.

Table 16

CAST Primary Sample - Arithmetic Reasoning Subtest

Correlation of Mean Item Statistic Difference by Position with Item Position (based on 50 item positions)

	ITEMPOS	PDF	BISDF	ABIDF	BBIDF	CBIDF	ALGDF	BLGDF	CLGDF	RCHDF	SCHDF
ITEMPOS	1.00000	0.94895	0.62586	-0.92673	-0.92315	0.42712	-0.92285	-0.81563	-0.40201	0.21712	0.63467
PDF	0.94895	1.00000	0.53552	-0.85788	-0.97946	-0.44377	-0.84743	-0.86337	-0.39056	0.24040	0.59422
BISDF	0.62586	0.53552	1.00000	-0.59325	-0.57095	-0.36758	-0.57869	-0.44520	-0.29266	0.48038	0.61012
ABIDF	-0.92673	-0.85788	-0.59325	1.00000	0.81972	0.42557	0.98336	0.73375	0.43486	-0.30897	-0.59508
BBIDF	-0.92315	-0.97946	-0.57095	0.81972	1.00000	0.52789	0.82029	0.83503	0.44667	-0.27582	-0.60319
CBIDF	-0.42712	-0.44377	-0.36758	0.42557	0.52789	1.00000	0.43185	0.47872	0.82429	-0.30033	-0.29106
ALGDF	-0.92285	-0.84743	-0.57869	0.98336	0.82029	0.43185	1.00000	0.68237	0.46729	-0.30245	-0.60666
BLGDF	-0.81563	-0.86337	-0.44520	0.73375	0.83503	0.47872	0.68237	1.00000	0.43188	-0.25572	-0.51174
CLGDF	-0.40201	-0.39056	-0.29266	0.43486	0.44667	0.82429	0.46729	0.43188	1.00000	-0.31638	-0.25813
RCHDF	0.21712	0.24040	0.48038	-0.30897	-0.27582	-0.30033	-0.30245	-0.25572	-0.31638	1.00000	0.34932
SCHDF	0.63467	0.59422	0.61012	-0.59508	-0.60319	-0.29106	-0.60666	-0.51174	-0.25813	0.34932	1.00000

Table 17

CAST Primary Sample - Word Knowledge Subtest
Correlation of Mean Item Statistic Difference by Position with Item Position (based on 50 item positions)

	ITEMPOS	PDF	BISDF	ABIDF	BBIDF	CBIDF	ALGDF	BLGDF	CLGDF	RCHDF	SCHDF
ITEMPOS	1.00000	0.85698	-0.90862	-0.64474	-0.73796	0.80755	-0.64051	-0.75505	0.65039	0.46895	0.73883
PDF	0.85698	1.00000	-0.78851	-0.68604	-0.89003	0.57995	-0.67415	-0.87802	0.43633	0.32677	0.59987
BISDF	-0.90862	-0.78851	1.00000	0.71431	0.74468	-0.76259	0.73113	0.77216	-0.57266	-0.35791	-0.66948
ABIDF	-0.64474	-0.68604	0.71431	1.00000	0.79564	-0.28769	0.95392	0.77228	-0.14949	-0.11586	-0.49313
BBIDF	-0.73796	-0.89003	0.74468	0.79564	1.00000	-0.33361	0.76321	0.98131	-0.23639	-0.17676	-0.56501
CBIDF	0.80755	0.57995	-0.76259	-0.28769	-0.33361	1.00000	-0.31890	-0.39965	0.80531	0.49969	0.58542
ALGDF	-0.64051	-0.67415	0.73113	0.95392	0.76321	-0.31890	1.00000	0.74690	-0.06916	-0.10110	-0.44873
BLGDF	-0.75505	-0.87802	0.77216	0.77228	0.98131	-0.39965	0.74690	1.00000	-0.24974	-0.16073	-0.57484
CLGDF	0.65039	0.43633	-0.57266	-0.14949	-0.23639	0.80531	-0.06916	-0.24974	1.00000	0.59479	0.55270
RCHDF	0.46895	0.32677	-0.35791	-0.11586	-0.17676	0.49969	-0.10110	-0.16073	0.59479	1.00000	0.42937
SCHDF	0.73883	0.59987	-0.66948	-0.49313	-0.56501	0.58542	-0.44873	-0.57484	0.55270	0.42937	1.00000

Next, we investigated the comparability of the item statistics and item parameter estimates for the two subtests by correlating the statistics and parameters from the forward and reverse forms across all 550 AR and WK items. These correlations are presented in Table 18. The key findings were:

- The p, r, and b statistics correlated .94, .84, and .95 (BILOG) and .86 (LOGIST), respectively, indicating that the estimates for these statistics were very comparable across the forward and reverse versions of each form.

- The forward-reverse correlations for the a and c parameters were somewhat lower. For a, the correlations for the BILOG and LOGIST estimates were .67 and .49, respectively. Correlations for the BILOG and LOGIST estimates of c were .65 and .46, respectively.

- The item parameter estimates from BILOG and LOGIST were highly correlated. For the a parameter, the BILOG-LOGIST correlation was .90 for the forward forms and .92 for the reverse forms. For b, the correlations were .98 and .97, respectively, while the correlations for c parameter estimates were .78 and .79, respectively. These results suggest that both programs yield highly similar item parameter estimates.

- The forward-reverse correlations of the bias indices for race and sex were .64 and .75, respectively.

These correlations showed that the forward and reverse forms of the subtests provided very comparable estimates of item parameters. Consequently, to simplify item screening, we used the average of the "forward" and "reverse" statistics from each form in all subsequent analyses.

Table 18

CAST Primary Sample
Correlation of Item Statistics (based on max n=550)

	P1	P2	BIS1	BIS2	A_BI1	A_BI2	B_BI1	B_BI2	C_BI1	C_BI2
P1	1.00000	0.93676	0.56506	0.56906	-0.35105	-0.28192	-0.93363	-0.89744	0.21948	0.24963
P2	0.93676	1.00000	0.58245	0.59107	-0.28516	-0.31572	-0.88544	-0.94398	0.23808	0.25772
BIS1	0.56506	0.58245	1.00000	0.84479	0.13578	0.11610	-0.60703	-0.61801	-0.17584	-0.00388
BIS2	0.56906	0.59107	0.84479	1.00000	0.10336	0.14377	-0.61528	-0.61048	-0.05511	-0.09295
A_BI1	-0.35105	-0.28516	0.13578	0.10336	1.00000	0.67327	0.31901	0.27192	0.06919	0.02605
A_BI2	-0.28192	-0.31572	0.11610	0.14377	0.67327	1.00000	0.24947	0.30568	-0.00560	0.14200
B_BI1	-0.93363	-0.88544	-0.60703	-0.61528	0.31901	0.24947	1.00000	0.94790	-0.08796	-0.13912
B_BI2	-0.89744	-0.94398	-0.61801	-0.61048	0.27192	0.30568	0.94790	1.00000	-0.13040	-0.11907
C_BI1	0.21948	0.23808	-0.17584	-0.05511	0.06919	-0.00560	-0.08796	-0.13040	1.00000	0.64849
C_BI2	0.24963	0.25772	-0.00388	-0.09295	0.02605	0.14200	-0.13912	-0.11907	0.64849	1.00000
A_LG1	-0.29655	-0.20712	0.18975	0.14624	0.89681	0.54529	0.33645	0.25361	0.04642	0.00640
A_LG2	-0.18996	-0.24554	0.13235	0.18181	0.56689	0.92268	0.20030	0.27943	0.01317	0.18407
B_LG1	-0.94423	-0.88068	-0.59211	-0.61685	0.35068	0.27303	0.98404	0.91606	-0.08499	-0.13208
B_LG2	-0.81666	-0.87572	-0.60877	-0.58834	0.21393	0.25911	0.91487	0.97356	-0.15478	-0.13980
C_LG1	0.08996	0.10060	-0.19053	-0.09120	0.12727	0.03989	0.03541	0.00061	0.77712	0.51864
C_LG2	0.10185	0.10264	-0.07363	-0.13735	0.10626	0.20840	0.01004	0.03790	0.49832	0.79340
RCH1	-0.05075	-0.05420	0.21558	0.18397	0.15474	0.16207	0.03588	0.04327	-0.14457	-0.11983
RCH2	-0.10123	-0.09103	0.14634	0.12825	0.13975	0.08445	0.09077	0.07567	-0.14332	-0.14372
SCH1	-0.14148	-0.17680	-0.04509	-0.01307	0.14569	0.16705	0.13139	0.16435	-0.02644	-0.04866
SCH2	-0.15763	-0.13238	-0.02825	-0.03239	0.15879	0.11861	0.15316	0.12716	-0.05707	-0.07036

Note: (1) the "1" suffix for each variable designates the forward form and "2," the reversed form.
(2) Item statistics correlated are:

percent correct	(P)	biserial corr	(BIS)
BILOG *a* estimates	(A_BI)	LOGIST *a* estimates	(A_LG)
b "	(B_BI)	*b* "	(B_LG)
c "	(C_BI)	*c* "	(C_LG)
race bias chi-sq	(RCH)	sex bias chi-sq	(SCH)

Table 18 (continued)

CAST Primary Sample
Correlation of Item Statistics (based on max n=550)

	A_LG1	A_LG2	B_LG1	B_LG2	C_LG1	C_LG2	RCH1	RCH2	SCH1	SCH2
P1	-0.29655	-0.18996	-0.94423	-0.81666	0.08996	0.10185	-0.05075	-0.10123	-0.14148	-0.15763
P2	-0.20712	-0.24554	-0.88068	-0.87572	0.10060	0.10264	-0.05420	-0.09103	-0.17680	-0.13238
BIS1	0.18975	0.13235	-0.59211	-0.60877	-0.19053	-0.07363	0.21558	0.14634	-0.04509	-0.02825
BIS2	0.14624	0.18181	-0.61685	-0.58834	-0.09120	-0.13735	0.18397	0.12825	-0.01307	-0.03239
A_BI1	0.89681	0.56689	0.35068	0.21393	0.12727	0.10626	0.15474	0.13975	0.14569	0.15879
A_BI2	0.54529	0.92268	0.27303	0.25911	0.03989	0.20840	0.16207	0.08445	0.16705	0.11861
B_BI1	0.33645	0.20030	0.98404	0.91487	0.03541	0.01004	0.03588	0.09077	0.13139	0.15316
B_BI2	0.25361	0.27943	0.91606	0.97356	0.00061	0.03790	0.04327	0.07567	0.16435	0.12716
C_BI1	0.04642	0.01317	-0.08499	-0.15478	0.77712	0.49832	-0.14457	-0.14332	-0.02644	-0.05707
C_BI2	0.00640	0.18407	-0.13208	-0.13980	0.51864	0.79340	-0.11983	-0.14372	-0.04866	-0.07036
A_LG1	1.00000	0.49162	0.34438	0.24284	0.20494	0.08493	0.16012	0.15736	0.09012	0.14159
A_LG2	0.49162	1.00000	0.20563	0.27539	0.06007	0.32243	0.14771	0.06587	0.13999	0.08540
B_LG1	0.34438	0.20563	1.00000	0.86063	0.04707	0.01245	0.03127	0.08514	0.12512	0.15645
B_LG2	0.24284	0.27539	0.86063	1.00000	-0.01433	0.04789	0.03947	0.06358	0.15291	0.11961
C_LG1	0.20494	0.06007	0.04707	-0.01433	1.00000	0.45739	-0.11882	-0.13683	-0.00378	-0.05692
C_LG2	0.08493	0.32243	0.01245	0.04789	0.45739	1.00000	-0.13500	-0.12529	-0.07049	-0.05964
RCH1	0.16012	0.14771	0.03127	0.03947	-0.11882	-0.13500	1.00000	0.63707	0.41884	0.33745
RCH2	0.15736	0.06587	0.08514	0.06358	-0.13683	-0.12529	0.63707	1.00000	0.36346	0.39099
SCH1	0.09012	0.13999	0.12512	0.15291	-0.00378	-0.07049	0.41884	0.36346	1.00000	0.75117
SCH2	0.14159	0.08540	0.15645	0.11961	-0.05692	-0.05964	0.33745	0.39099	0.75117	1.00000

Note: (1) the "1" suffix for each variable designates the forward form and "2," the reversed form.
(2) Item statistics correlated are:

percent correct	(P)	biserial corr	(BIS)
BILOG a estimates	(A_BI)	LOGIST a estimates	(A_LG)
b "	(B_BI)	b "	(B_LG)
c "	(C_BI)	c "	(C_LG)
race bias chi-sq	(RCH)	sex bias chi-sq	(SCH)

<u>Psychometric issues</u>. Following our analysis of item position effects, we turned to an investigation of the psychometric properties of the items. The purpose of this investigation was to ensure that all test items were of high psychometric quality. Key goals of these analyses were to ensure that:

- all items discriminate reasonably well between high and low ability individuals
- items are not biased against black or female examinees
- the item pool includes a range of easy and difficult items.

Table 19 shows the distribution of mean percent correct of the new and existing AR items. The table shows that the existing 225 items were more difficult than the new items. The median percent correct for the existing items was 34%, while the median percent correct for the new items was 53%. Table 20 shows the distribution of mean biserial correlations of the new and existing AR items. All of the new AR items had biserial correlations of at least .20 with total score, and most of the biserial correlations were between .40 and .60.

Table 19

CAST Arithmetic Reasoning: Distribution of Difficulty (percent correct) for New and Old Items

Percent Correct	SOURCE New N Percent	Old N Percent	TOTAL
.10 - <.20	0 0.00	18 8.00	18
.20 - <.30	6 12.00	58 25.78	64
.30 - <.40	10 20.00	62 27.56	72
.40 - <.50	6 12.00	40 17.78	46
.50 - <.60	12 24.00	25 11.11	37
.60 - <.70	0 0.00	14 6.22	14
.70 - <.80	9 18.00	8 3.56	17
.80 - <.90	7 14.00	0 0.00	7
TOTAL	50	225	275

Table 20

CAST Arithmetic Reasoning: Distribution of Biserial Correlation for New and Old Items

Biserial Correlation	SOURCE New N Percent	Old N Percent	TOTAL
Negative Value	0 0.00	1 0.44	1
.10 - <.20	0 0.00	4 1.78	4
.20 - <.30	2 4.00	21 9.33	23
.30 - <.40	6 12.00	36 16.00	42
.40 - <.50	12 24.00	67 29.78	79
.50 - <.60	26 52.00	80 35.56	106
.60 - <.70	4 8.00	16 7.11	20
TOTAL	50	225	275

Table 21 shows the distribution of the mean percent correct of the new and existing WK items. The new and existing items both include a range of easy and difficult items, but the new items generally were somewhat easier. The median percent correct for the existing items was 78%, while the median percent correct for the new items was 81%. Table 22 shows the distribution of the mean biserial correlations for the new and existing items. All except two of the new items had biserial correlations of .20 or greater.

We plotted the biserial correlation and the percent correct for each item in each subtest to help identify items that did not discriminate well between high and low ability examinees. The plots of the AR items is in Figure 3, while Figure 4 contains plot for the WK items. If we eliminate all items with a biserial correlation of .20 or less, we will drop five AR items and two WK items from the item pool.

Table 21

CAST Word Knowledge: Distribution of Difficulty (percent correct) for New and Old Items

Percent Correct	SOURCE New N Percent	Old N Percent	TOTAL
0 - <.10	1 0.51	0 0.00	1
.10 - <.20	2 1.02	1 1.28	3
.20 - <.30	1 0.51	5 6.41	6
.30 - <.40	9 4.57	2 2.56	11
.40 - <.50	16 8.12	3 3.85	19
.50 - <.60	17 8.63	12 15.38	29
.60 - <.70	23 11.68	8 10.26	31
.70 - <.80	28 14.21	10 12.82	38
.80 - <.90	44 22.34	15 19.23	59
.90 - 1.00	56 28.43	22 28.21	78
TOTAL	197	78	275

Table 22

CAST Word Knowledge: Distribution of Biserial Correlation for New and Old Items

Biserial Correlation	SOURCE New N Percent	Old N Percent	TOTAL
0 - <.10	1 0.51	0 0.00	1
.10 - <.20	1 0.51	0 0.00	1
.20 - <.30	10 5.08	0 0.00	10
.30 - <.40	15 7.61	1 1.28	16
.40 - <.50	37 18.78	6 7.69	43
.50 - <.60	70 35.53	37 47.44	107
.60 - <.70	58 29.44	30 38.46	88
.70 - <.80	5 2.54	4 5.13	9
TOTAL	197	78	275

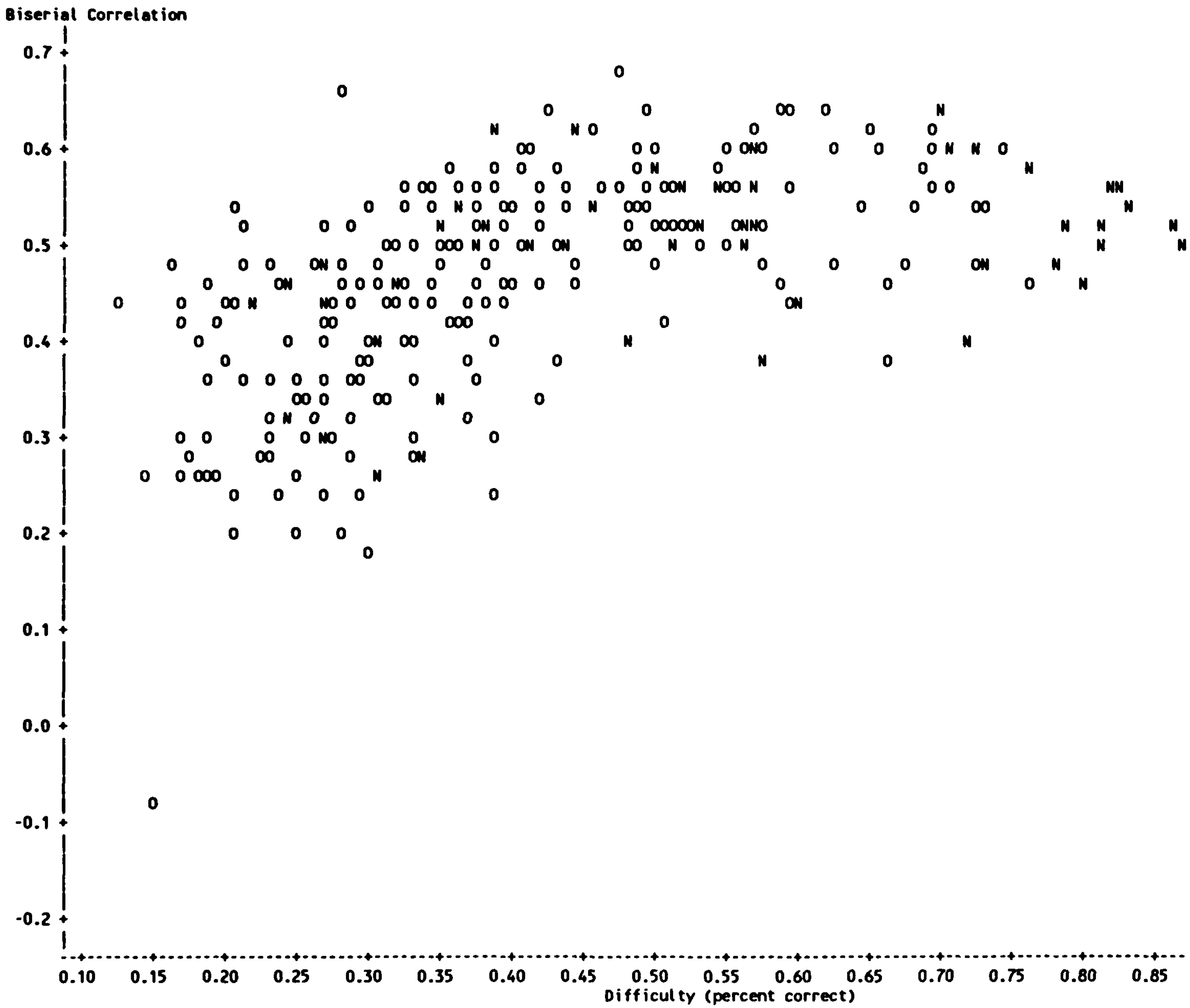


Figure 3. CAST Arithmetic Reasoning: PLOT OF Biserial Correlation by Difficulty (percent correct)

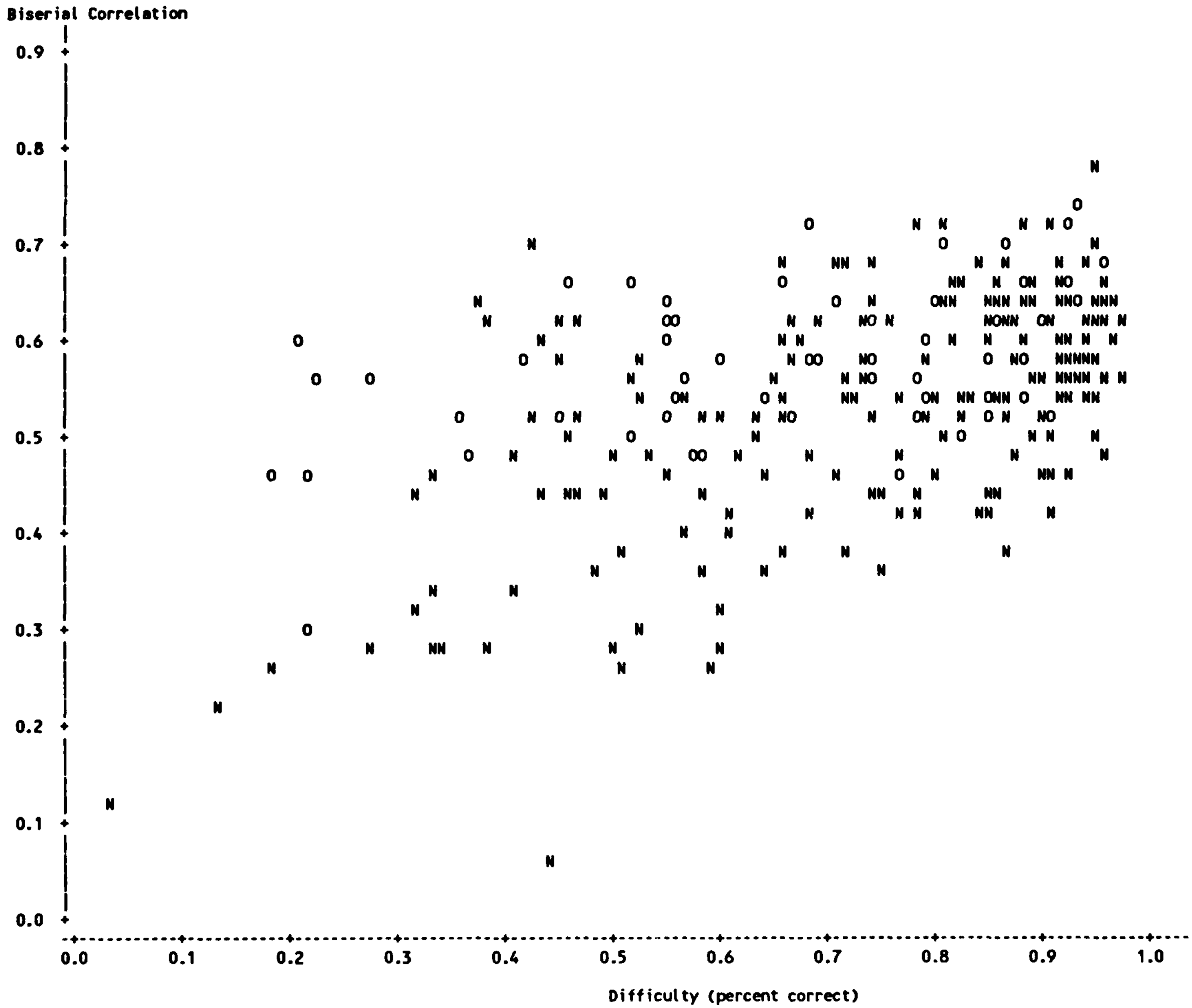


Figure 4. CAST Word Knowledge: PLOT OF Biserial Correlation by Difficulty (percent correct)

Tables 23 and 24 show the distribution of chi-square values for race bias for the AR and WK subtests, respectively. Both tables show that over 80% of the new and existing items had chi-squares between -5 and +5. There were approximately equal numbers of items with positive and negative chi-squares.

Table 23

CAST Arithmetic Reasoning: Distribution of

Chi-squares for New and Old Items for Race

	SOURCE		
Chi-square	New N Percent	Old N Percent	TOTAL
>-15 - -10	0 0.00	1 0.44	1
>-10 - -5	1 2.00	14 6.22	15
>-5 - <0	27 54.00	67 29.78	94
0 - <5	16 32.00	117 52.00	133
5 - <10	6 12.00	20 8.89	26
10 - <15	0 0.00	5 2.22	5
15 - <20	0 0.00	1 0.44	1
TOTAL	50	225	275

Table 24

CAST Word Knowledge: Distribution of

Chi-squares for New and Old Items for Race

Chi-square	SOURCE New N Percent	Old N Percent	TOTAL
>-15 - -10	4 2.03	2 2.56	6
>-10 - -5	10 5.08	2 2.56	12
>-5 - <0	104 52.79	33 42.31	137
0 - <5	66 33.50	32 41.03	98
5 - <10	7 3.55	4 5.13	11
10 - <15	4 2.03	3 3.85	7
15 - <20	1 0.51	2 2.56	3
>25	1 0.51	0 0.00	1
TOTAL	197	78	275

Tables 25 and 26 show the distribution of chi-square values for sex bias for the AR and WK subtests, respectively. Again, about 80% of the items had chi-squares between -5 and +5. Again, the median chi-square was near 0 for both subtests.

Table 25

CAST Arithmetic Reasoning: Distribution of

Chi-squares for New and Old Items for Sex

Chi-square	SOURCE New N Percent	SOURCE Old N Percent	TOTAL
>-15 - -10	2 4.00	4 1.78	6
>-10 - -5	5 10.00	6 2.67	11
>-5 - <0	27 54.00	68 30.22	95
0 - <5	12 24.00	114 50.67	126
5 - <10	4 8.00	25 11.11	29
10 - <15	0 0.00	7 3.11	7
15 - <20	0 0.00	1 0.44	1
TOTAL	50	225	275

Table 26

CAST Word Knowledge: Distribution of

Chi-square for New and Old Items for Sex

Chi-square	SOURCE New N Percent	Old N Percent	TOTAL
<- 25	3 1.52	0 0.00	3
>-25 - -20	0 0.00	1 1.28	1
>-15 - -10	2 1.02	0 0.00	2
>-10 - -5	17 8.63	1 1.28	18
>-5 - <0	115 58.38	41 52.56	156
0 - <5	50 25.38	26 33.33	76
5 - <10	6 3.05	4 5.13	10
10 - <15	1 0.51	2 2.56	3
15 - <20	1 0.51	1 1.28	2
20 - <25	2 1.02	2 2.56	4
TOTAL	197	78	275

To identify items that showed large bias against black or females, we plotted the race and sex chi-square values against one another. The plot for the AR items is found in Figure 5, and the plot for the WK items is in Figure 6. If we use a cutoff of chi-square value of 20, which corresponds approximately to a p-value of .001, three AR items and 12 WK items will be eliminated for race or sex bias.

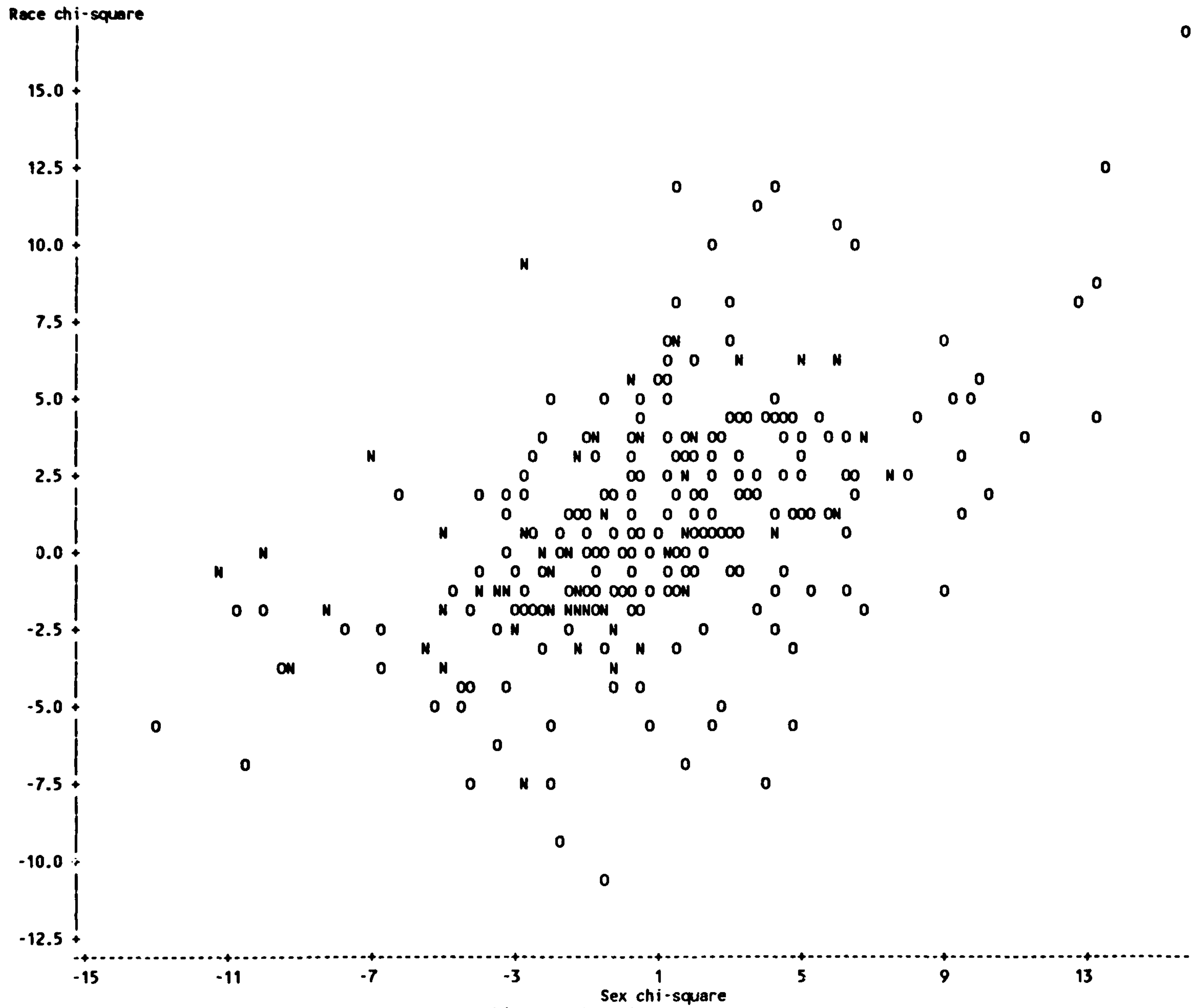


Figure 5. CAST Arithmetic Reasoning -- PLOT OF Race chi-square by chi-square

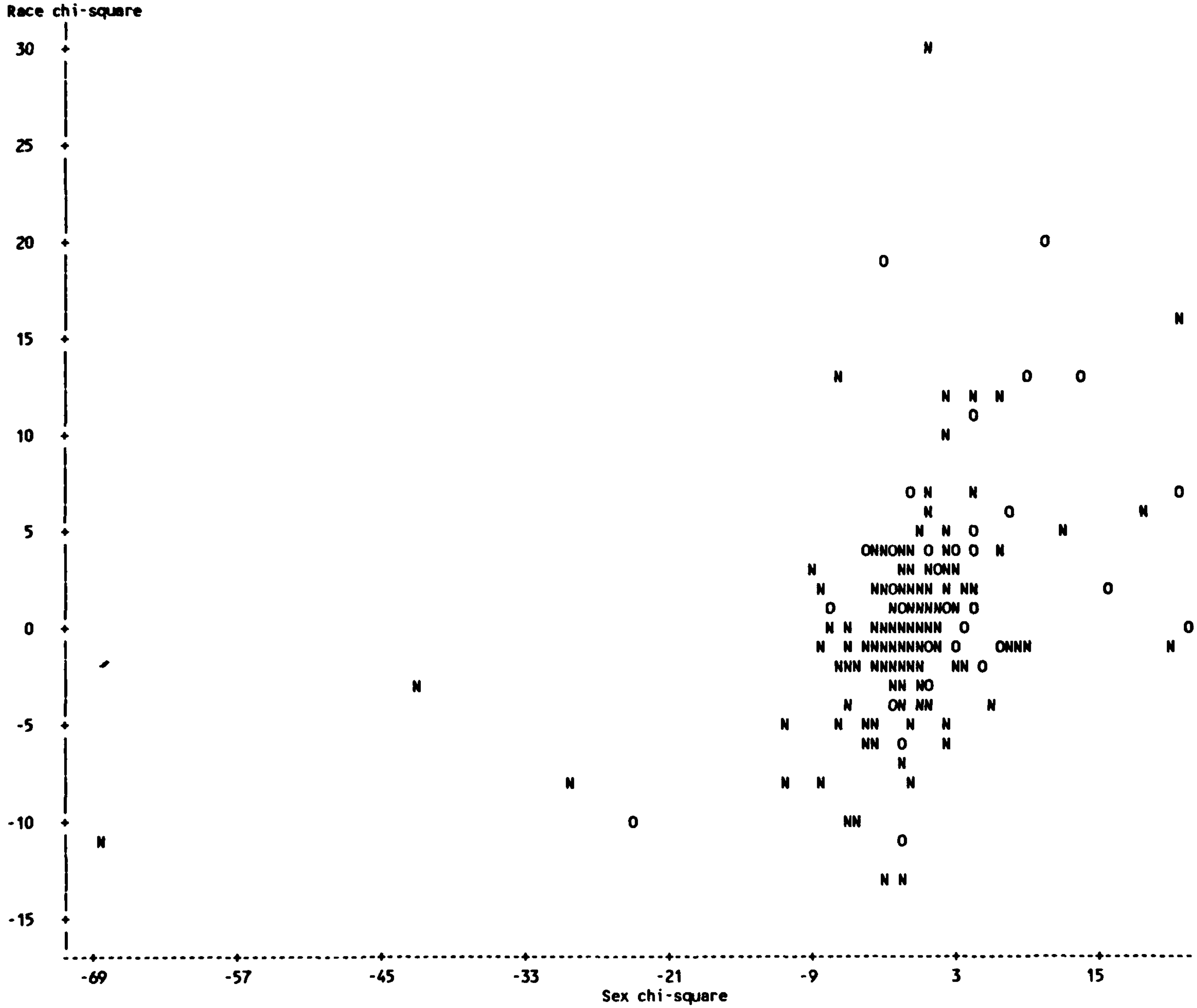


Figure 6. CAST Word Knowledge -- PLOT OF Race chi-square by Sex chi-square

The list of items that we are proposing to delete from the item pool is presented in Table 27. The list includes all items with biserial item-total correlations less than or equal to .20 plus all items with a chi-square bias index less than or equal to -20 or greater than or equal to +20. The list consists of 19 items. It includes five AR items and 14 WK items, and eight new items plus 11 existing items. It is not readily apparent why these items did not discriminate between high and low ability examinees as well as other items in the item pool, or why these items showed larger race or sex bias than other items.

Table 27

Proposed Item Eliminations

Item	Form	No.	Reason (plus stem, for WK items)
AR124+	A01	27	Low discrim (Bis=-.09) due to printing
WK020	W02	23	Low discrim (Bis=.05) terse
WK035	W04	29	Low discrim (Bis=.11) exhaustive
AR265+	A02	01	Low Discrim (Bis=.17)
WK098	W01	26	Race Bias (Chi2=57.7) frayed
WK210+	W05	38	Race Bias (Chi2=39.1) ladle
WK220+	W06	37	Race Bias (Chi2=35.0) knoll
WK212+	W04*	17	Sex Bias (Chi2=53.8) lurked
WK235+	W06	25	Sex Bias (Chi2=41.3) agile
WK003	W05	06	Sex Bias (Chi2=39.9) dirigible
WK031	W06	11	Sex Bias (Chi2=24.5) pillaged
WK151	W03	36	Race/Sex Bias (Chi2=30.1/43.0) terrain
AR086+	A01	24	Race/Sex Bias (Chi2=24.5/27.4)
AR129+	A02	02	Race/Sex Bias (Chi2=24.6/26.0)
AR121+	A06	09	Race/Sex Bias (Chi2=18.4/31.7)
WK251+	W01	01	Race/Sex Bias (Chi2=24.1/25.5) ascent
WK001	W06*	12	Sex Bias (Chi2=-68.8) apprehension
WK002	W01	25	Sex Bias (Chi2=-51.6) tepid
WK233+	W02	35	Sex Bias (Chi2=-45.3) dishevel

* Anchor item used in all forms
+ Current Operational Item

Item Calibration

Equating Across Forms or Subsamples

When multiple forms of a test are constructed, there is no guarantee that raw scores mean the same thing on all the test forms. Three strategies for investigating equating were examined. First, as there was random assignment of examinees to each of the forms, the samples may be assumed to have equivalent ability distribution. The results in Tables 10 and 11 show that there was a uniform number of candidates across the subtest forms. If the samples are truly random, any significant differences in test performance could be attributed to differences in the difficulties of the items in the different forms. Second, each form contained the same five anchor items so that the samples may be equated based on the performance on the five anchor items (Stocking & Lord 1983). However, the small number of anchor items and varying item position of those anchors may limit this method. Third, we may equate the subsamples to prior CAST calibrations or to prior ASVAB distributions. Equating to prior CAST calibrations may be more useful for AR forms than for WK forms because of a greater number of existing AR items.

Equivalence of subsamples. For AR, means and standard deviations (Table 28) and results of a one-way analysis of variance (F=.24, p=.95, df=5, 19,637, see Table 29) showed that none of the observed differences among the AR forms was significant. Similarly, for the WK, form means (Table 30) and a one-way ANOVA (F=1.29, p=.27, df 5, 17,233, see Table 31) revealed no differences among the WK forms.

Another way to document equivalence of the subsamples is to use theta estimates to predict 1980 AFQT scores. Table 32 shows the ANOVA summary tables for the predicting AFQT using AR and WK thetas, respectively. Of interest is the main effect for form and the interaction of the respective thetas with form. If the samples are equivalent, these terms would be non-significant, and they, in fact, were non-significant on both the AR and WK forms. Although the theta*form on the AR form was marginally significant (p.<.06), the F-value was a trivial 2.09. In sum, means of each subtest form showed that the subsamples are equivalent, and when thetas were linked to AFQT scores, the forms showed no differential prediction of the external criterion.

Table 28

Primary Sample Mean Test Scores For the Arithmetic Reasoning Test

Form 1	N	Mean	S.D.
Arithmetic Reasoning	3358	20.557	5.339
Word Knowledge	3358	27.260	5.195
Form 2	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3337	20.657	5.464
Word Knowledge	3337	27.422	5.141
Form 3	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3253	20.684	5.414
Word Knowledge	3253	27.314	5.311
Form 4	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3299	20.674	5.415
Word Knowledge	3299	27.330	5.176
Form 5	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3230	20.642	5.501
Word Knowledge	3230	27.371	5.264
Form 6	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3166	20.631	5.368
Word Knowledge	3166	27.409	5.204

Table 29

Summary Table for Analysis of Variance on Equivalent Subsamples

Arithmetic Reasoning Test Scores

Source	df	Sum of Squares	Mean Squares	F value	p
AR Forms	5	34.71	6.94	0.24	.95
Error	19637	576218.97	29.34		
Total	19642	576253.68			

Table 30

Primary Sample Mean Test Scores For the Word Knowledge Test

Form 1	N	Mean	S.D.
Arithmetic Reasoning	3322	20.684	5.394
Word Knowledge	3322	27.371	5.239
Form 2	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3325	20.637	5.429
Word Knowledge	3325	27.345	5.191
Form 3	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3209	20.673	5.362
Word Knowledge	3209	27.449	5.168
Form 4	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3326	20.726	5.445
Word Knowledge	3326	27.412	5.304
Form 5	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	851	20.900	5.387
Word Knowledge	851	26.959	5.450
Form 6	**N**	**Mean**	**S.D.**
Arithmetic Reasoning	3206	20.514	5.426
Word Knowledge	3206	27.344	5.205

Table 31

Summary Table for Analysis of Variance on Equivalent Subsamples

Word Knowledge Test Scores

Source	df	Sum of Squares	Mean Squares	F value	p
WK Forms	5	176.05	35.21	1.29	.27
Error	17233	471997.56	27.39		
Total	17238	472173.61			

Table 32

Analysis of Variance Summary Table For 1980 AFQT Scores

Arithmetic Reasoning Forms

Source	df	Sum of Squares	Mean Squares	F value	p
AR Theta	1	2928791.57	2928791.57	20326.79	.0001
WK Theta	1	865882.43	865882.43	6009.51	.0001
AR Form	5	486.94	97.39	0.68	.64
AR Theta*Form	5	741.80	148.36	1.03	.40
WK Theta*Form	5	1507.07	301.41	2.09	.06
Error	15,580	2244849.23	144.09		
Total	15,597	6042259.04			

Word Knowledge Forms

Source	df	Sum of Squares	Mean Squares	F value	p
AR Theta	1	2928791.57	2928791.57	20319.63	.0001
WK Theta	1	865882.43	865882.43	6007.41	.0001
WK Form	5	264.46	52.89	0.37	.87
AR Theta*Form	5	403.83	80.77	0.56	.73
WK Theta*Form	5	1277.32	255.46	1.77	.11
Error	15,580	2245639.42	144.14		
Total	15,597	6042259.04			

Anchor item equating. Equating through the 5-item common anchor was based on the Stocking and Lord (1983) procedure. This procedure finds the linear scaling of the theta values that maximizes the agreement in the test characteristic curve (TCC) for two samples. The TCC is the expected number of correct responses for each level of ability. Tables 33 and 34 show, for each of the five anchor items, the *a*, *b*, and *c* estimates for AR and WK forms.

Figures 7 and 8 show the 5-item TCCs prior to equating for the six subsamples for AR and WK, respectively. Figures 9 and 10 show TCCs after equating for AR and WK, respectively. For the AR form, the TCCs after equating were closer together at the upper end of the curves, thus indicating improvement after equating. However, for the WK subsamples, there was no noticeable improvement after equating. Variations in the WK TCCs prior to equating could simply be sample to sample fluctuations, thus limiting any post hoc adjustment.

Table 33

Arithmetic Reasoning Anchor Item Parameter Estimates

ITEM AR013 — Item Parameter

SAMPLE	POSITION	a	b	c
AR01	37	0.96546	-0.33629	0.22213
AR02	43	1.02003	-0.42587	0.19261
AR03	46	0.95621	-0.02867	0.25909
AR04	32	1.10933	-0.26242	0.16720
AR05	44	1.00062	-0.35420	0.15848
AR06	11	0.87013	-0.40281	0.17450

ITEM AR041

SAMPLE	POSITION	a	b	c
AR01	11	1.66848	0.54500	0.13993
AR02	41	1.69860	0.59939	0.15115
AR03	1	1.50577	0.74970	0.17176
AR04	43	1.54100	0.72854	0.16165
AR05	49	1.89012	0.53693	0.18592
AR06	4	1.50378	0.93626	0.19613

ITEM AR066

SAMPLE	POSITION	a	b	c
AR01	36	1.59426	-0.47197	0.25662
AR02	18	1.50881	-0.45551	0.12713
AR03	16	1.56877	-0.52949	0.14073
AR04	11	1.43772	-0.43846	0.17563
AR05	11	1.59886	-0.23020	0.31775
AR06	49	1.36187	-0.25942	0.26589

ITEM AR246

SAMPLE	POSITION	a	b	c
AR01	41	1.69076	0.88560	0.26510
AR02	50	1.58190	0.96488	0.27824
AR03	43	1.51023	0.99116	0.27041
AR04	14	2.02123	1.01011	0.29776
AR05	34	1.47056	0.70708	0.21746
AR06	6	1.70472	1.08448	0.28120

ITEM AR268

SAMPLE	POSITION	a	b	c
AR01	38	1.45382	2.27389	0.17644
AR02	7	1.42578	2.34269	0.16158
AR03	30	1.29656	2.38274	0.16009
AR04	27	1.78955	2.18925	0.17928
AR05	14	1.26139	2.10386	0.14497
AR06	40	1.13447	2.42661	0.12607

Table 34

Word Knowledge Anchor Item Parameter Estimates

ITEM WK001 — Item Parameter

SAMPLE	POSITION	a	b	c
WK01	39	3.02633	0.48042	0.08740
WK02	48	3.46279	0.47986	0.12443
WK03	9	3.76074	0.50902	0.11740
WK04	5	3.40463	0.61906	0.20000
WK05	18	3.91469	0.45710	0.11616
WK06	12	3.20768	0.41161	0.12438

ITEM WK110

SAMPLE	POSITION	a	b	c
WK01	29	1.72646	-0.21346	0.36203
WK02	14	1.37352	-0.61056	0.20199
WK03	40	1.65547	-0.31818	0.30755
WK04	38	1.33399	-0.73731	0.20000
WK05	5	1.31179	-0.60255	0.22542
WK06	14	1.22442	-0.55855	0.30637

ITEM WK129

SAMPLE	POSITION	a	b	c
WK01	47	1.78611	-0.03922	0.23460
WK02	11	1.80841	0.03850	0.22458
WK03	41	2.03906	0.01832	0.24092
WK04	41	1.52901	-0.08482	0.20000
WK05	7	1.93670	0.09023	0.25683
WK06	19	1.79401	0.01665	0.28590

ITEM WK212

SAMPLE	POSITION	a	b	c
WK01	9	0.93672	-1.2995	0.11805
WK02	5	1.00459	-1.2426	0.09288
WK03	16	1.02634	-1.1294	0.14753
WK04	17	1.27291	-0.9128	0.20000
WK05	16	1.09606	-0.7686	0.25719
WK06	8	1.07844	-1.0067	0.16290

ITEM WK262

SAMPLE	POSITION	a	b	c
WK01	6	1.86352	-1.5605	0.20523
WK02	34	1.77574	-1.5004	0.11063
WK03	37	1.75568	-1.5648	0.28538
WK04	12	2.53511	-1.3747	0.20000
WK05	14	1.96680	-1.5172	0.22897
WK06	46	1.81805	-1.5056	0.21987

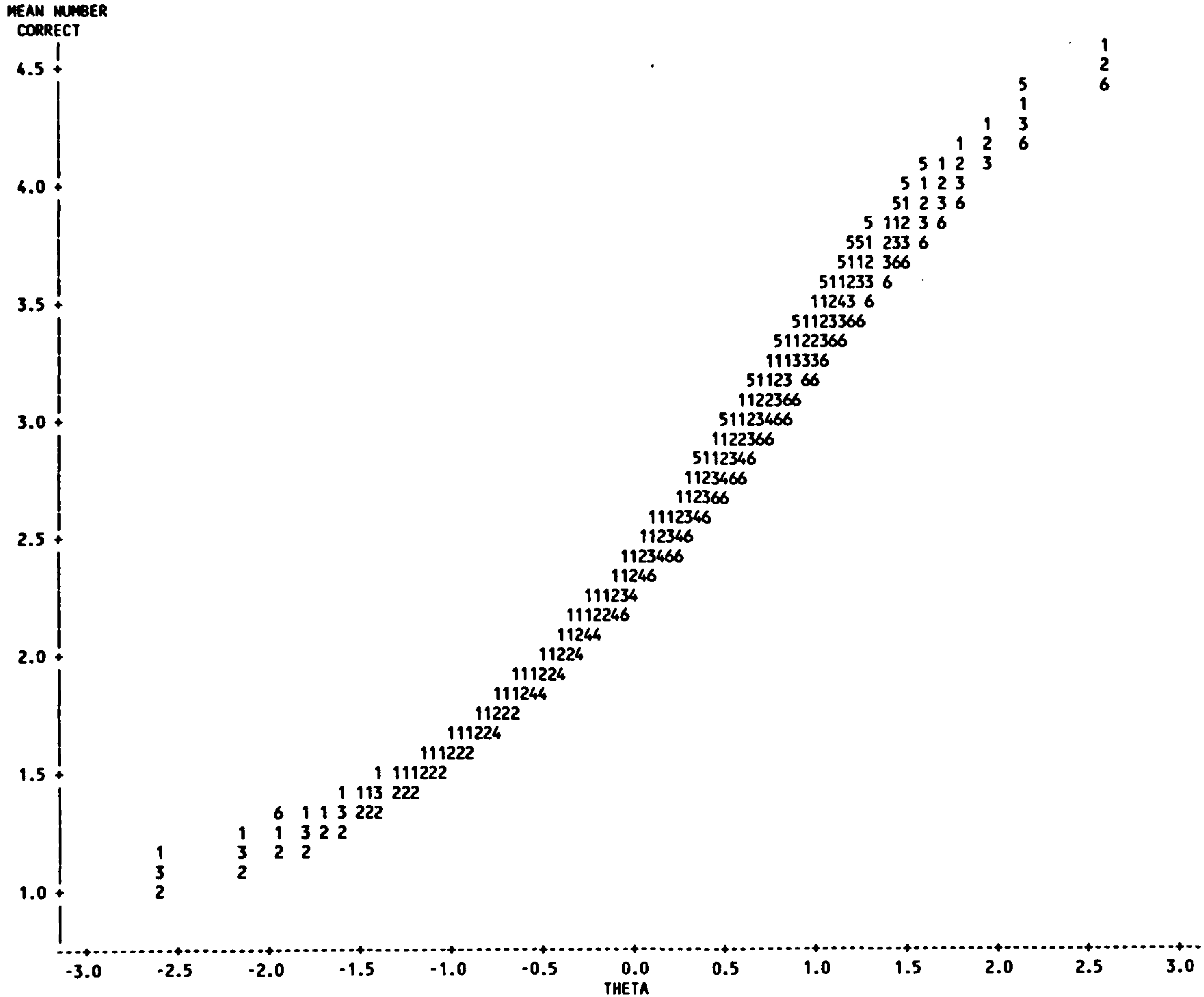


Figure 7. Arithmetic Reasoning Anchor Items Test Characteristic Curves Before Equating

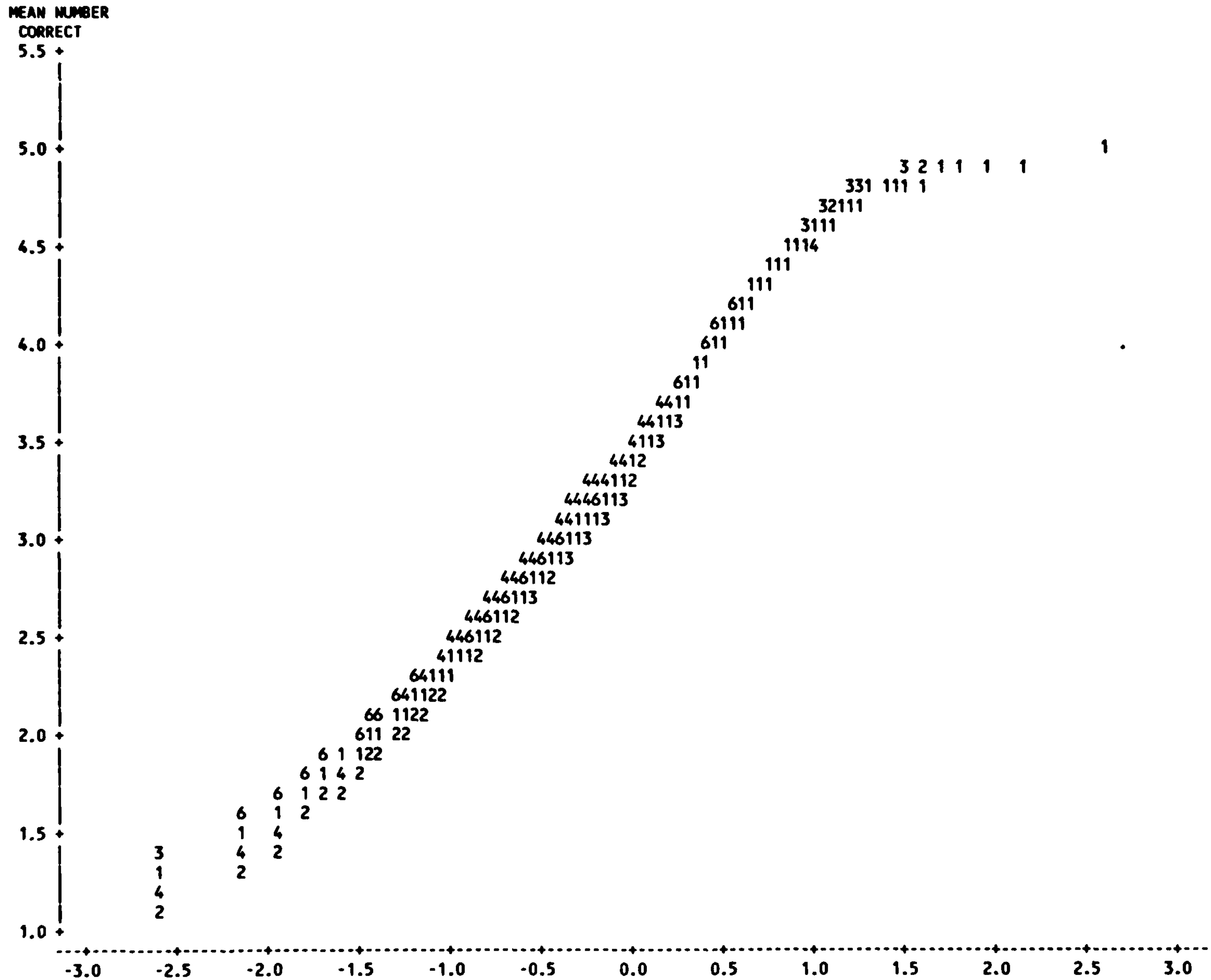


Figure 8. Word Knowledge Anchor Items Test Characteristic Curves **Before** Equating

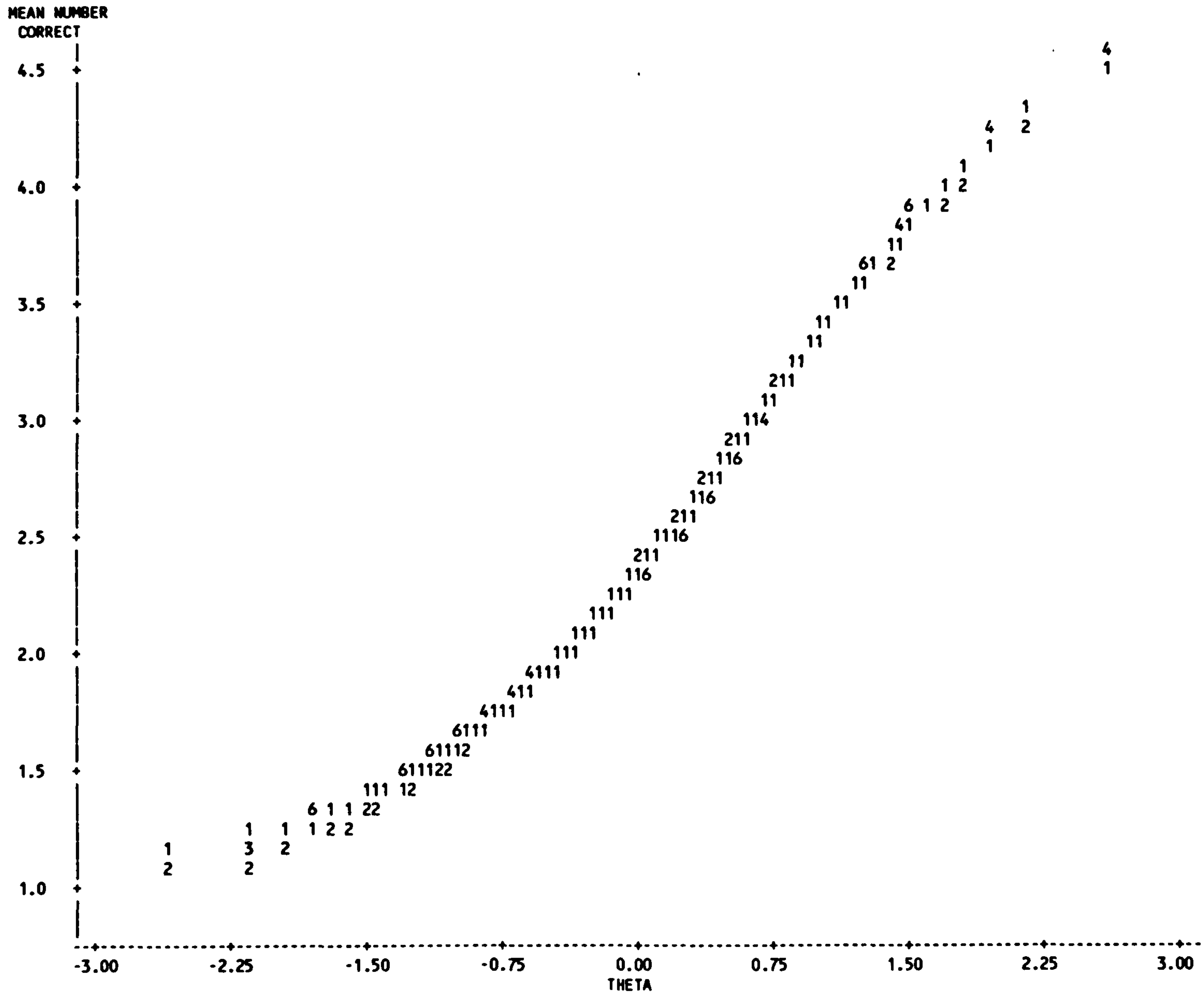


__Figure 9__.

Arithmetic Reasoning Anchor Items Test Characteristic Curves __After__ Equating

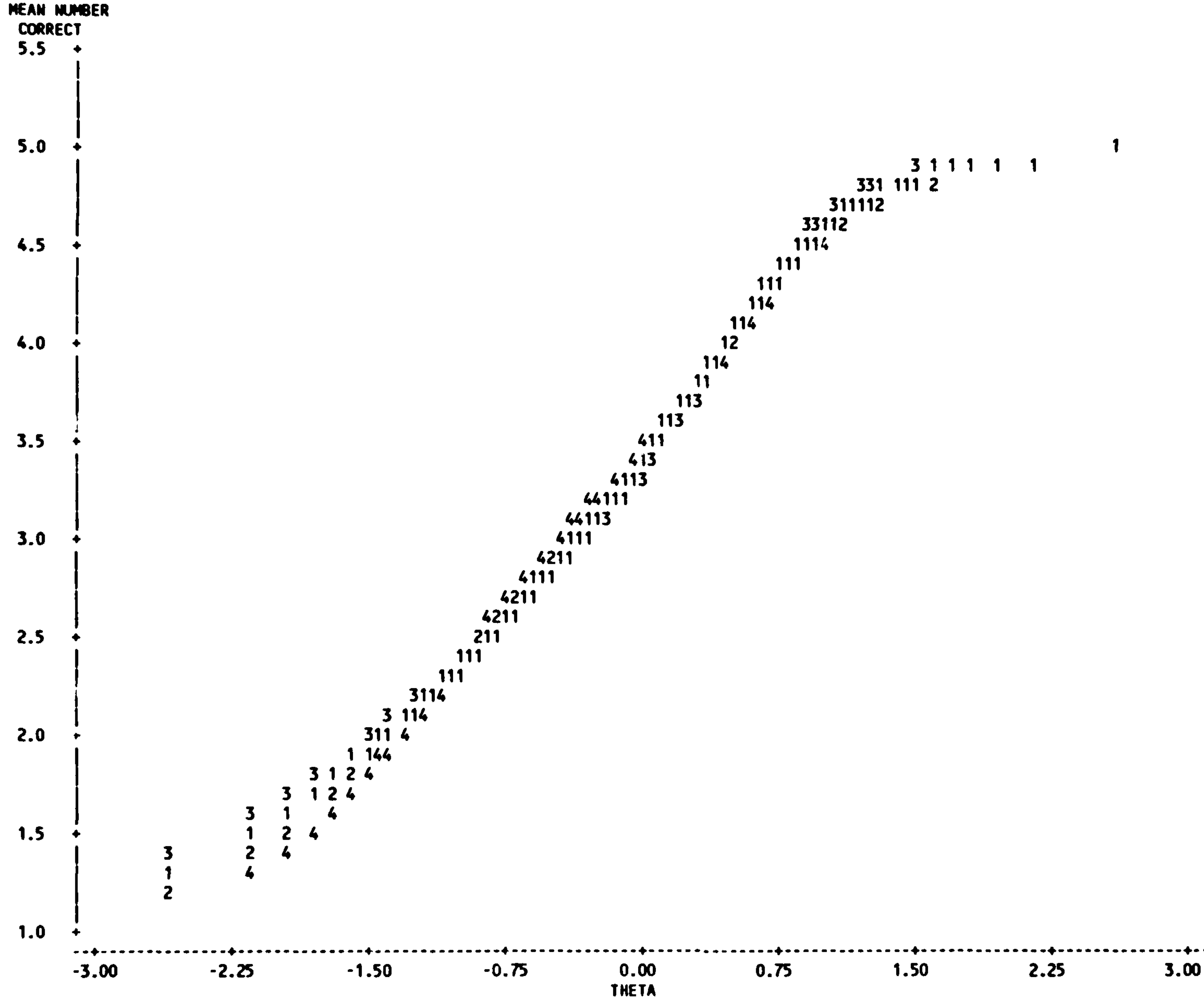


Figure 10. Word Knowledge Anchor Items Test Characteristic Curves *After* Equating

Adjusting to prior calibrations. A third method of equating investigated was adjusting each sample to prior AR and WK calibrations for CAST. First, we equated the subtest score variances for each subsample to that of the ASVAB AR or WK. The equating coefficients and constants are presented in the second column in Table 35. All the resultant coefficients are near one, and constants are near zero, supporting equivalence of the samples. The second attempt was to adjust samples according to the difficulty measure (b) or discrimination index (a) from prior calibrations of operational CAST items. The resulting coefficients are shown in the last two columns of Table 35. Possibly with the exception for the coefficients resulting from equating to prior b's for forms 1 and 2 of WK, coefficients for other forms supported equivalence of subsamples.

Final item estimates from primary sample

Results presented earlier showed that the item parameter estimation programs--LOGIST and BILOG--both yielded equivalent results. We have also documented position effects for identical items appearing in different locations on the subtest. We also found that excluding the not reached items did improve estimation marginally. For example, there was some reduction in magnitude of position effects and a reduction in the number of extreme values in item parameter estimates. Moreover, the data collection procedures yielded subsamples that were largely equivalent to start with; additional equating procedures yielded no significant improvement in the results. Based on these findings, IRT estimates for operational calibration were obtained on the combined half samples using BILOG with free-floating priors. No further adjustments for differences between samples were made. Effectively, the estimates are based on about 3,200 individuals. For each form, we computed percent correct, biserial correlation, and a, b, and c parameter estimates. In addition to the chi-square test for race and sex bias, two IRT bias indices were also computed. Item statistics and parameter estimates for the combined forms are tabulated in Appendix C.

The procedure for computing the IRT bias indices is similar to that reported by Linn, Levine, Hastings, and Wardrop (1981). First, the theta axis between -3 and +3 is divided into 51 equal probability levels according to the distribution of scores on the minority group (i.e. blacks or females). The 51 levels corresponded to z values on the normal curve which in turn were based on subtest percentile scores. Both indices take into account the areas enclosed by the two ICCs. The first index gives the direction of the bias of the item. In the example shown in Figure 11, the area ('A') where the majority ICC is higher than the minority ICC is first computed. The area ('B') where the minority ICC exceeds the majority ICC is also computed. A positive

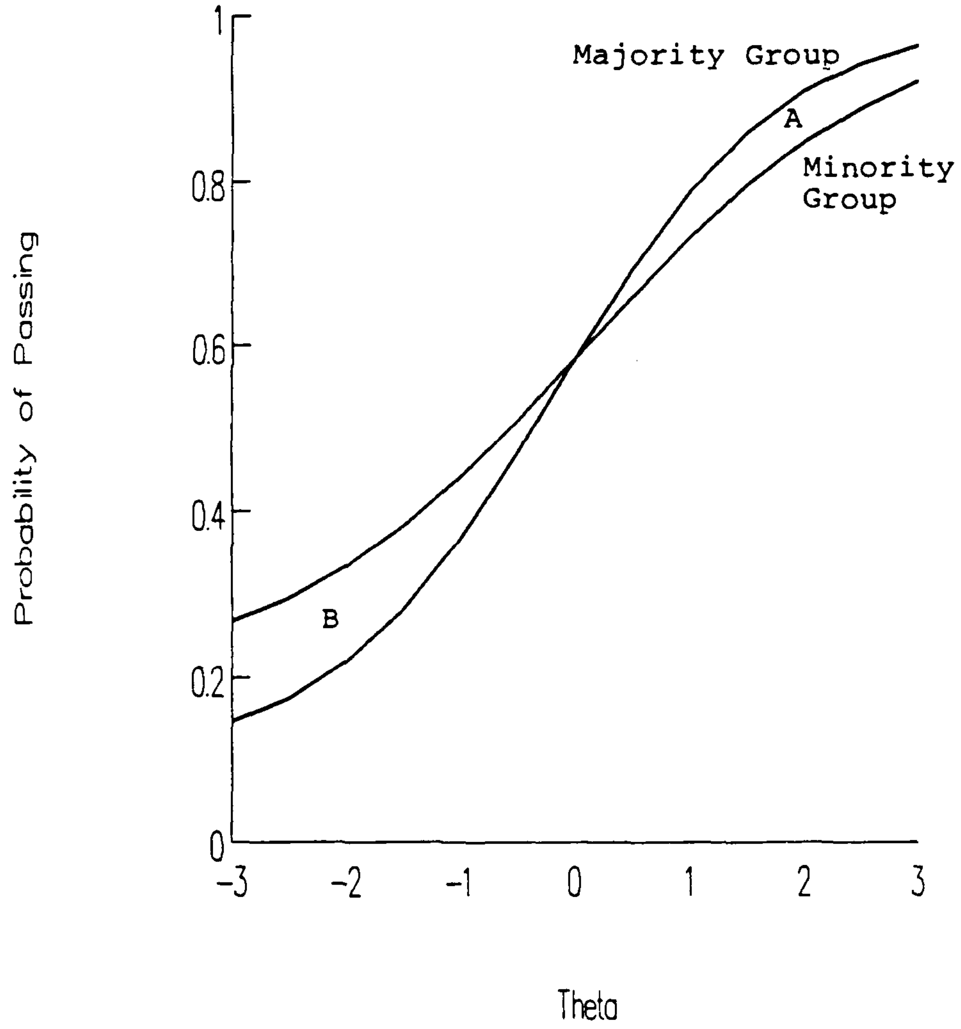
difference of the two areas (area A minus area B) indicates an advantage for the majority group and a negative difference, an advantage for the minority group. The second bias index is the sum of the two areas, and it represents the total amount of bias of the item for the two comparison groups.

Table 35

Alternative Scale Conversions for Each Form/Subsample

Form/ Subsample	ASVAB AR/WK Distrib.	Anchor Item Equating	Equating to Prior Difficulty	Equating to Prior Slopes
		COEFFICIENT		
A01	0.98	1.08	0.99	0.94
A02	1.01	0.85	1.00	1.03
A03	1.00	1.02	1.06	1.02
A04	1.00	1.14	1.04	0.96
A05	1.01	0.85	1.00	0.99
A06	1.00	1.08	0.93	1.06
W01	0.99	1.02	0.86	0.97
W02	0.99	1.08	1.48	1.05
W03	0.98	0.92	0.97	1.07
W04	1.01	0.90	1.00	0.91
W05	1.03	0.95	1.05	1.06
W06	0.99	1.02	1.01	0.95
		CONSTANT		
A01	-0.02	0.05	-0.04	
A02	0.00	0.09	-0.01	
A03	0.01	-0.04	0.01	
A04	0.01	-0.11	-0.06	
A05	0.01	0.17	0.06	
A06	-0.01	-0.17	0.04	
W01	0.01	.00	0.08	
W02	.00	0.01	-0.08	
W03	0.03	-0.06	.00	
W04	0.02	-0.01	-0-.14	
W05	-0.05	-0.04	0.26	
W06	.00	0.06	-0.11	

Example of Bias in ICCs



<u>Figure 11</u>

Supplemental Sample Calibration

Calibration of items tested on the supplemental sample presented a greater challenge. First, under the best conditions, each item was based on data gathered from only about 300 individuals. Second, each examinee was exposed to a maximum of six or nine experimental items only. Third, as the test was administered adaptively, the difficulty of items was confounded with examinee ability. Given such constraints, a simultaneous item parameter estimation and theta estimation was deemed inappropriate. Instead, we used a modified logistic regression of probability of passing on operational theta estimates. Both $\underline{a}$ and $\underline{b}$ estimates were estimated iteratively using a least-squares criterion. The $\underline{c}$ parameter was held constant at .20. The function that was fitted was:

$$\hat{P}=.2+.8/(1=\exp(-a*(\text{theta}-b))).$$

Table 36 shows the correlations among the difficulty and slope parameter estimates from the primary and supplemental samples and from the previous calibrations of CAST items. The very high correlations among the difficulty estimates show that the prior estimates still appear reasonable. Further, there do not appear to be differential effects of mode-of-presentation. The supplemental sample (computer-administered) difficulties correlated .95 and .98 with the primary sample (paper-and-pencil) difficulties for AR and WK, respectively.

The relatively low correlations among the slope estimates are disappointing, but not surprising. The supplemental sample battery included only 21 currently operational items. The estimation procedure led to a few relatively large values. These two facts explain the lack of correlations for the supplemental sample slope estimates.

Table 36

Correlation of Item Parameter Estimates from Primary Sample, Supplemental Sample, and Operational Calibrations

Parameter	Prior AR	Prior WK	Primary AR	Primary WK
Difficulty				
Primary.	.94	.92		
Suppl.	.92	.95	.96	.98
Slope				
Primary	.53	.36		
Suppl.	.12	.36	.31	-.06

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Table 37

AFQT Prediction

The goal of the Computer Adaptive Screening Test (CAST) Refinement Project is to predict subsequent scores the Armed Services Vocational Aptitude Battery (ASVAB) ability composite, known as the Armed Forces Qualifying Test (AFQT). This composite is used as a selection screen and has been shown to be a valid predictor of training success and job performance for a wide range of military jobs (Campbell, 1986).

Since 1980, the AFQT has consisted of equally weighted verbal and quantitative components, and a half-weighted speeded subtest (VE + AR + 1/2 NO). Over the past couple of years a committee known as Joint Service Selection and Classification Working Group (JSSCWG) has investigated whether a different composite of ASVAB subtest scores would serve as a better predictor of training success. In the Fiscal Year 1989, a new AFQT composite will be implemented. This new AFQT composite will consist of two times VE, plus AR, and Math Knowledge (MK). Table 37 shows the ASVAB subtests and their weights for the two AFQT composites.

Because the Army is interested in the validity of the CAST for both AFQT composites, the analyses in this section was conducted for both the current 1980 and new 1989 composites. The CAST data used for these analyses was collected in the form of a paper-and-pencil test outlined in a previous section entitled Primary Calibration Sample. This section will address three issues under the topic of AFQT Prediction:

- How well does the CAST Predict AFQT?
- How does the prediction of AFQT in the current project compare with prior studies?
- Are there subgroup differences in AFQT prediction?

Table 37

CAST Prediction of AFQT: Two AFQT Composites

AFQT Composite	ASVAB Subtest
Current 1980 AFQT	VE + AR + 1/2*NO
New 1989 AFQT	2*VE + AR + MK

CAST's Validity

The first issue concerns the validity of CAST in predicting AFQT scores, and the accuracy with which the CAST classifies potential recruits into AFQT categories. The validity of the CAST was assessed by regressing AFQT scores onto CAST subtest scores for both the 1980 and 1989 AFQT composites. Table 38 contains the regression results.

Table 38

Prediction of AFQT: Regression Results

AFQT Composite	Uncorrected Multiple-R	Corrected* Multiple-R
AFQT 1980 = 9.57*AR + 8.87*WK + 58.03	.791	.909
AFQT 1989 = 10.27*AR + 9.50*WK + 56.11	.818	.915
**AFQT 1980 = 9.23 * (AR + WK) + 57.95	.791	.909
**AFQT 1989 = 9.88 * (AR + WK) + 56.11	.818	.915

*Correlation coefficients were corrected for range restriction in the sample.

**Both AR and WK were unit-weighted (i.e., summed and correlated with AFQT).

The uncorrected Multiple-Rs of .791 and .818 in Table 38 suggest that the CAST is a highly accurate predictor of AFQT score. The .027 difference of the two Multiple-Rs represents a statistically significant difference at the .05 alpha level. Therefore, CAST is a better predictor of the new AFQT composite than the current AFQT composite. The difference in the corrected coefficients, .006, is also significant at the .05 level. The correct coefficients of .909 and .915 are extremely high and approach the test-retest reliability of the measures. Table 38 further shows that using unit-weighting does not affect the Multiple-R even at the third decimal place.

For the purpose of the following classification analyses the AFQT categories were combined into three groups, 1-3A,

3B, and 4-5. These categories represent enlistment decisions: (a) recruits scoring in the 1-3A range are eligible for possible enlisted bonuses, (b) recruits scoring in the 3B or higher range are eligible for enlistment, and (c) recruits scoring below 3B are ineligible for enlistment under current normal conditions.

The Army is most interested in screening out individuals who are in the 4-5 range since they represent applicants which have a high probability of scoring below Army standards on the ASVAB. The ability of the CAST to correctly classify potential recruits into AFQT categories was investigated by cross tabulating predicted AFQT category with actual AFQT category attained on the ASVAB. AFQT categories are created by partitioning AFQT percentile scores into groupings that represent different AFQT abilities. Table 39 contains the cross tabulation of predicted and actual 1980 AFQT and Table 40 contains the cross tabulation predicted and actual 1989 AFQT.

Table 39

Cast Prediction of Current 1980 AFQT Categories

Predicted	Actual AFQT Category			
AFQT Cat	1-3A	3B	4-5	TOTAL
1-3A	10,115 (73.96%)	1,894 (13.85%)	1,668 (12.20%)	13,677
3B	1,162 (20.08%)	3,126 (54.02%)	1,499 (25.90%)	5,787
4-5	166 (26.31%)	215 (34.07%)	250 (39.62%)	631
TOTAL	11,443	5,235	3,417	20,095

Table 40

Cast Prediction of New 1989 AFQT Categories

Predicted AFQT Cat	Actual AFQT Category 1-3A	3B	4-5	TOTAL
1-3A	9,189 (74.32%)	1,674 (13.54%)	1,501 (12.14%)	12,364
3B	1,180 (17.65%)	3,273 (48.95%)	2,234 (33.41%)	6,687
4-5	195 (18.68%)	306 (29.31%)	543 (52.01%)	1,044
TOTAL	10,564	5,253	4,278	20,095

These tables show that the CAST has a classification efficiency of 67.1% for the 1980 composite and 64.7% for the 1989 composite. This classification efficiency was computed by simply summing the main diagonal and dividing by the total count. It should be pointed out that the classifications presented in these tables are based on a sample with significant range restriction. When used operationally, the CAST screens applicants who show a much larger range of abilities. Therefore, the classification efficiency of the operational CAST would be expected to be higher.

As a screening device, the value of the CAST is found in its ability to minimize false positive and false negative decisions by providing information to a recruiter about whether to send or not to send a recruit up for testing on the ASVAB. If we consider the send/do not send decision based on the prediction that the prospect will score in category 3B or above, the CAST is correct 82.3% of the time for the 1980 AFQT composite and 78.9% of the time for the 1989 composite.

Comparison with Prior Research

The second major issue concerns how well the correlation between CAST scores and attained AFQT scores compares with results found in prior research. Sands and Gade (1983) conducted an initial pilot test with 312 subjects and found that the correlation of CAST score and AFQT score was .85. In two later cross-validation studies Pliske, Gade, and

Johnson (1984), and Knapp and Pliske (1985) found the correlation between CAST and AFQT to be around .80. The results of the current study (see Table 41), with much larger samples, are consistent with the earlier findings. Uncorrected Multiple-Rs of .79 and .82 were attained for the 1980 and 1989 composites, respectively.

Table 41

Comparison of AFQT Prediction: Current vs. Prior Research

Source	Criterion	N	R	Comments
Sands & Gade (1983)	1980 AFQT	312	.85	Original CAST Validation
Pliske, Gade, & Johnson (1984)	1980 AFQT	1,962	.80	Initial CAST Cross-Validation
Knapp & Pliske (1985)	1980 AFQT	5,929	.79	National Cross-Validation
The present project	1980 AFQT	17,729	.79	CAST Refinement Project
The present project	1989 AFQT	17,729	.82	CAST Refinement Project

Subgroup Analyses

The third major issue under the topic of the CAST's prediction of AFQT scores concerns possible subgroup biases. Humphreys (1986) feels that the term "difference" is preferable to "bias" due to emotive connotations of the word "bias." "Some differences," according to Humphreys, "may be less important, less easily correctable, or even intrinsic to the measurement process" (p. 327). Despite the discussion of proper terms, it is most important to use an accurate model to investigate subgroup differences in employment decisions. Based on the regression model, Cleary (1968) has formalized a definition of test bias:

> A test is biased for members of a subgroup of the population if, in the prediction of a criterion for which the test was designed, consistent nonzero errors of prediction are made for members of the subgroup. In other words, the test is biased if the criterion score predicted from the common regression line is consistently too high or too low for members of the subgroup. With this definition of bias, there may be a connotation of "unfair," particularly if the use of the test produces a prediction that is too low. (p. 115)

The distinction Cleary has made between test bias and test fairness in the above definition is an important one. It is quite conceivable that at test may be biased (e.g., equal slopes but different intercepts) and still be fair (e.g., no under-prediction of minority criterion scores). It is also possible that there will be differences in both slopes and intercepts, and the test will still be fair. Countless studies that have found both of these types of results have reported over-prediction of minority criterion scores (Campbell, Crooks, Mahoney, & Rock, 1973; Gael, Grant, & Richie, 1975a; Gael, Grant, & Richie, 1975b; Gordon, 1975; Gordon, & Rudert, 1979; Jensen, 1980; Schmidt, Pearlman, & Hunter, 1980).

The debate over the source of slope differences continues today. Much work with meta-analytic techniques suggest that differential validity is due only to statistical artifacts (Hunter, Schmidt, & Hunter, 1979). The evidence for statistically significant differences in the intercept have found wider support. In a review of 1,190 racial group comparisons, Bartlett, Bobko, Mosier, and Hannan (1979) found significant intercept differences in about 18% of the comparisons. Once again it is unclear if these intercept differences are in the test itself. As Humphreys (1986) has pointed out, this "intercept bias is not in the test, but in the combination of test, criterion, and groups being compared" (p. 332).

Four steps based on the regression-line framework endorsed by

Cleary, (1968; Guidelines, 1978; SIOP, 1987) which takes mean differences in predictors and criteria into account, will be used to evaluate possible subgroup differences. These steps involve: (a) comparing subgroup differences on mean predictor and criterion scores; (b) comparing correlations between CAST and AFQT scores; (c) evaluating regression results with subgroups as moderators; and (d) comparing regression equations between subgroups and combined sample to determine any over- or under-prediction.

Mean predictor and criterion scores. Table 42 and 43 contain means and standard deviations of CAST subtest ability estimates (thetas), ASVAB AR and WK subtest scores, AFQT scores, and predicted AFQT scores based on combined regression equations.

Table 42

Mean Scores for Total Sample and by Gender

	Total			Males			Females		
Variable	Mean	S.d.	N	Mean	S.d.	N	Mean	S.d.	N
1980 AFQT	58.10	19.66	17,729	58.18	20.03	13,877	57.95	18.27	3,776
1989 AFQT	56.26	20.35	17,729	56.78	20.76	13,877	54.56	18.67	3,776
Predicted 1980 AFQT	57.90	15.43	20,032	58.10	15.80	15,757	57.28	13.99	4,195
Predicted 1989 AFQT	56.06	16.51	20,032	56.26	16.91	15,757	55.41	14.98	4,195
Estimated AR Theta	0.00	0.95	20,088	0.03	0.98	15,801	-0.12	0.84	4,207
Estimated WK Theta	0.00	0.98	20,039	-0.02	0.99	15,763	0.05	0.92	4,196
ASVAB AR Subtest Score	52.13	7.32	17,729	52.55	7.35	13,877	50.66	6.99	3,776
ASVAB WK Subtest Score	52.47	6.02	17,729	52.51	6.08	13,877	52.34	5.76	3,776

The means found in Table 42 show that on the average, males score slightly higher on ASVAB AR and WK subtests and on the AFQT composite. Males and females appear to have very similar theta estimates, with males scoring slightly higher on AR and females slightly higher on WK. These differences are very small and are not statistically significant.

Table 43 clearly shows that whites score, on average, higher than Blacks on all predictors and criteria. These findings are consistent with the literature on general cognitive testing (Dreger, & Miller, 1968; Shuey, 1966). The differences found here (approximately .75 of a standard deviation) are the same as Hunter (1983) has reported with the GATB. It also appears that if we compare predicted AFQT with actual AFQT for whites, the values are very similar. If we make these comparisons for Blacks, average over-prediction of 2.5 to 3 AFQT points is found.

Table 43

Mean Scores for Total Sample and by Race

	Total			Whites			Blacks		
Variable	Mean	S.d.	N	Mean	S.d.	N	Mean	S.d.	N
1980 AFQT	58.10	19.66	17,729	63.93	18.81	11,072	46.79	15.77	4,594
1989 AFQT	56.26	20.35	17,729	62.43	19.20	11,072	44.13	16.51	4,594
Predicted 1980 AFQT	57.90	15.43	20,032	62.45	14.92	12,283	49.44	12.26	5,113
Predicted 1989 AFQT	56.06	16.51	20,032	60.93	15.96	12,283	47.00	13.13	5,113
Estimated AR Theta	0.00	0.95	20,088	0.22	0.97	12,311	-0.45	0.73	5,133
Estimated WK Theta	0.00	0.98	20,039	0.27	0.90	12,287	-0.47	0.88	5,115
ASVAB AR Subtest Score	52.13	7.32	17,729	54.08	6.91	11,072	47.96	6.50	4,594
ASVAB WK Subtest Score	52.47	6.02	17,729	54.31	5.14	11,072	49.24	5.87	4,594

Subgroup correlations. Table 44 shows uncorrected and corrected correlations between CAST subtest scores and AFQT scores for the total sample and by subgroup. Differences between correlations were determined by transforming the correlations into Fisher's z-values, computing a 95% confidence interval (CI) for each r, and assessing whether the CIs overlapped. For the two sets of Multiple-Rs, this exercise represents a test of differential validity (American Educational Research Association, 1985; Boehm, 1972; Humphreys, 1973).

Table 44 shows that the CAST is an equally valid predictor of AFQT scores for both males and females. In fact, all corrected correlations between CAST subtest and AFQT for males and females do not differ by more than chance. These findings suggest no differential validity by males and females. Although the differences between correlation coefficients for females and males are not significant, females' coefficients are consistently larger. This finding is consistent with what Schmitt, Mellon, and Bylenga (1978) found with 6,219 pairs of male and female validity coefficients for males and females.

When the correlations for Blacks and whites are corrected for range restriction, there are no significant differences in any of the correlations. There appears to be no differential validity between Blacks and whites when the CAST is used to predict AFQT.
This finding is consistent with the large body of literature that has examined differential validity between Blacks and whites and determined that it is a myth (Bartlett, Bobko, Mosier, & Hannan, 1978; Hunter, Schmidt, & Hunter, 1979; Schmidt, Berner, & Hunter, 1973).

In conclusion, it appears from these results that the CAST is an equally valid predictor of AFQT for males and females, and Blacks and whites. The next section will evaluate, using the regression model, the size of gender and race moderator effects. The final section will evaluate fairness of CAST for race and gender subgroups.

Table 44

Correlations Among CAST Subtest and AFQT Scores

Method	Current 1980 AFQT Correlation Uncor-rected	Cor-rected*	N	New 1989 AFQT Correlation Uncor-rected	Cor-rected*	N
Totals						
CAST AR Subtest	.70	.87	17,722	.72	.87	17,722
CAST WK Subtest	.68	.87	17,683	.71	.87	17,683
Multiple-R	.79	.91	17,676	.82	.92	17,676
CAST AR By Race						
Whites	.69	.88	11,068	.71	.89	11,068
Blacks	.56	.89	4,592	.58	.88	4,592
Difference	.13**	-.01		.13**	.01	
CAST WK by Race						
Whites	.64	.87	11,049	.67	.87	11,048
Blacks	.57	.89	4,575	.62	.89	4,575
Difference	.07**	-.02		.05**	.02	
Multiple-R By Race						
Whites	.77	.91	11,044	.80	.92	11,044
Blacks	.68	.92	4,572	.72	.92	4,572
Difference	.09**	-.01		.08**	.00	
CAST AR by Gender						
Males	.70	.87	13,871	.71	.87	13,871
Females	.70	.89	3,775	.71	.89	3,775
Difference	.00	-.02		.00	-.02	
CAST WK by Gender						
Males	.69	.87	12,416	.72	.86	12,416
Females	.68	.89	3,121	.71	.89	3,121
Difference	.01	-.02		.01	-.03	
Multiple-R by Gender						
Males	.79	.91	12,411	.82	.91	12,411
Females	.80	.92	3,120	.82	.93	3,120
Difference	-.01	-.01		.00	-.02	

*Correlation coefficients were corrected for range restriction in the

**Correlation coefficients are significantly different using Fisher's for differences between correlation coefficients.

Subgroups as moderators. Tables 45-48 contain the regression results by subgroup for both the 1980 and 1989 AFQT composites. In these analyses the sample sizes for the subgroups of interest--females and Blacks--are 3,764 and 4,573 respectively. While the previous analyses looked solely at differences in validity, these present analyses will simultaneously look at differences in validity (slope) and in errors of prediction (intercept).

The results in Tables 45 and 46 suggest that there are small but statistically significant differences in the subgroup main effects and in the CAST AR subtest by subgroup interactions for the 1980 AFQT composite. When the new 1989 AFQT composite is used, the main effect of gender remains significant, while the interaction of gender with AR subtest scores is reduced. The amount of variance in the gender main effect and the two gender by subgroup interactions combined, is very small and represents less than .01% of the total variance in both models.

Table 45

Prediction of 1980 AFQT* with Gender as Moderator

Source	DF	SS	F Value	PR > F
AR CAST Subtest Score	1	3307736.07	22881.70	0.0001
WK CAST Subtest Score	1	957052.41	6620.54	0.0001
Gender	1	2604.63	18.02	0.0001
AR*Gender	1	1202.32	8.32	0.0039
WK*Gender	1	75.26	0.52	0.4706
Error	17,594	2543355.96		
Total	17,599	6812026.67		

*17,600 Observations used in the analysis: 13,836 males and 3,764 females.

Table 46

Prediction of 1989 AFQT* with Gender as Moderator

Source	DF	SS	F Value	PR > F
AR CAST Subtest Score	1	3766513.20	27542.05	0.0001
WK CAST Subtest Score	1	1118916.28	8181.90	0.0001
Gender	1	2978.02	21.78	0.0001
AR*Gender	1	678.57	4.96	0.0259
WK*Gender	1	40.86	0.30	0.5846
Error	17,594	2406069.18		
Total	17,599	7295199.11		

*17,600 Observations used in the analysis: 13,836 males and 3,764 females.

In the analyses of moderator effects by race for the 1980 composite, the main effect of race and interactions were significant. When the new AFQT was used the race main effect continued to be significant while the WK by race interaction was not significant at the .05 alpha level (see Table 46). The amount of variance in the race main effect and the two race by subgroup interactions combined, represents less than 1% of the total variance for the 1980 and 1989 composites.

Table 47

Prediction of 1980 AFQT* with Race as Moderator

Source	DF	SS	F Value	PR > F
AR CAST Subtest Score	1	2963973.46	21216.21	0.0001
WK CAST Subtest Score	1	797767.26	5710.44	0.0001
Race	1	53044.39	379.69	0.0001
AR*Race	1	2738.04	19.60	0.0001
WK*Race	1	2328.01	16.66	0.0001
Error	15,612	2181046.87		
Total	15,617	6000898.04		

*15,618 Observations used in the analysis: 11,045 whites and 4,573 Blacks.

Table 48

Prediction of New AFQT* with Race as Moderator

Source	DF	SS	F Value	PR > F
AR CAST Subtest Score	1	3368778.44	25571.18	0.0001
WK CAST Subtest Score	1	959044.79	7279.76	0.0001
Race	1	57827.23	438.95	0.0001
AR*Race	1	2361.53	17.93	0.0001
WK*Race	1	774.14	5.88	0.0154
Error	15,612	2056744.28		
Total	15,617	6445530.41		

*15,618 Observations used in the analysis: 11,045 whites and 4,573 Blacks.

<u>Differential slopes and intercepts</u>. Figures 12-15 present a linear composite of AR and WK theta values (after being added together), plotted against predicted AFQT based on the total sample regression equation. Each figure has this regression line for the minority and majority groups, and overall. These figures show the relative size of intercept differences, and more importantly, the range of positive and negative errors of prediction.

Back in Table 43 we saw that the mean predicted AFQT score exceeded the actual mean AFQT score for Blacks while the predicted and actual scores for whites were very similar. This finding is that, on average, the CAST over-predicts performance on the ASVAB for Blacks. Given that in many instances both over- and under-prediction occur across the range of abilities (i.e., regression lines intersect), it is important to determine the range of abilities for which over- vs. under-prediction will take place.

Figures 12-15 show the range of over- and/or under-prediction of the subgroups if a single overall regression equation is used to predict AFQT. If the subgroup's regression equation falls below the common regression line, then the use of the common regression line will result in the over-prediction of criterion performance for that subgroup. Conversely, if the subgroup's regression equation lies above the common regression line, this will result in under-prediction.

Figures 12 and 13 contain the subgroup vs. overall comparison for males and females for the 1980 and 1989 AFQT composites, respectively. When the combined regression equation is used for the 1980 AFQT, females are over-predicted when their ability is between 0-37, and under-predicted between 37-100. When the combined regression equation is used for the 1989 composite, females are over-predicted from 0-100 (the entire range of abilities).

Figure 14 contains the subgroup vs. overall comparisons for Blacks and whites for the 1980 AFQT composite, and Figure 15 contains the comparisons for the 1989 AFQT. When the combined regression equation is used for the 1980 AFQT, Blacks are under-predicted for the 0-30 ability range and over-predicted for the 31-100 range. When the combined regression equation is used for the 1989 composite, Blacks are under-predicted from 0-21, and over-predicted from 22-100. Practically speaking, this under-prediction for the 0-21 range does not present a problem since applicants across this range of ability would not be sent to take the ASVAB.

When the CAST is used to predict the 1989 AFQT composite, no under-prediction of females or Blacks will occur across the significant ability levels use for making screening decisions. These findings show that the CAST is a fair screening device.

Conclusion

The analyses in this section on AFQT prediction support the following two assertions:

- the CAST is a valid predictor of AFQT
- the CAST is fair to both females and Blacks

The results in the first two sections are consistent with prior research in finding Multiple-Rs around .80. When these correlation coefficients were corrected for range restriction they were found to be in the low .90s. The subgroup analyses found no significant mean predictor and criterion differences between males and females, and significant mean predictor and criterion differences between Blacks and Whites. The significance tests between correlation coefficients found no differences between males and females, and no significant differences between Blacks and whites. Therefore, no differential validity was found between subgroups.

The regression results show very small but statistically significant differences in the AR by gender interaction, and a significant gender main effect. Small but statistically significant subtest by race interactions were also found.

The race main effect was fairly large as compared to the gender main effect but still accounted for a very small amount of the overall variance.

A comparison of the subgroup and common regression equations for the 1989 AFQT composite revealed that no under-prediction of either females or Blacks occurred across the range of abilities for which screening decisions are made. Therefore, the use of the common prediction equation is fair for both females and Blacks.

Figure 12

Predicted 1980 AFQT by Gender

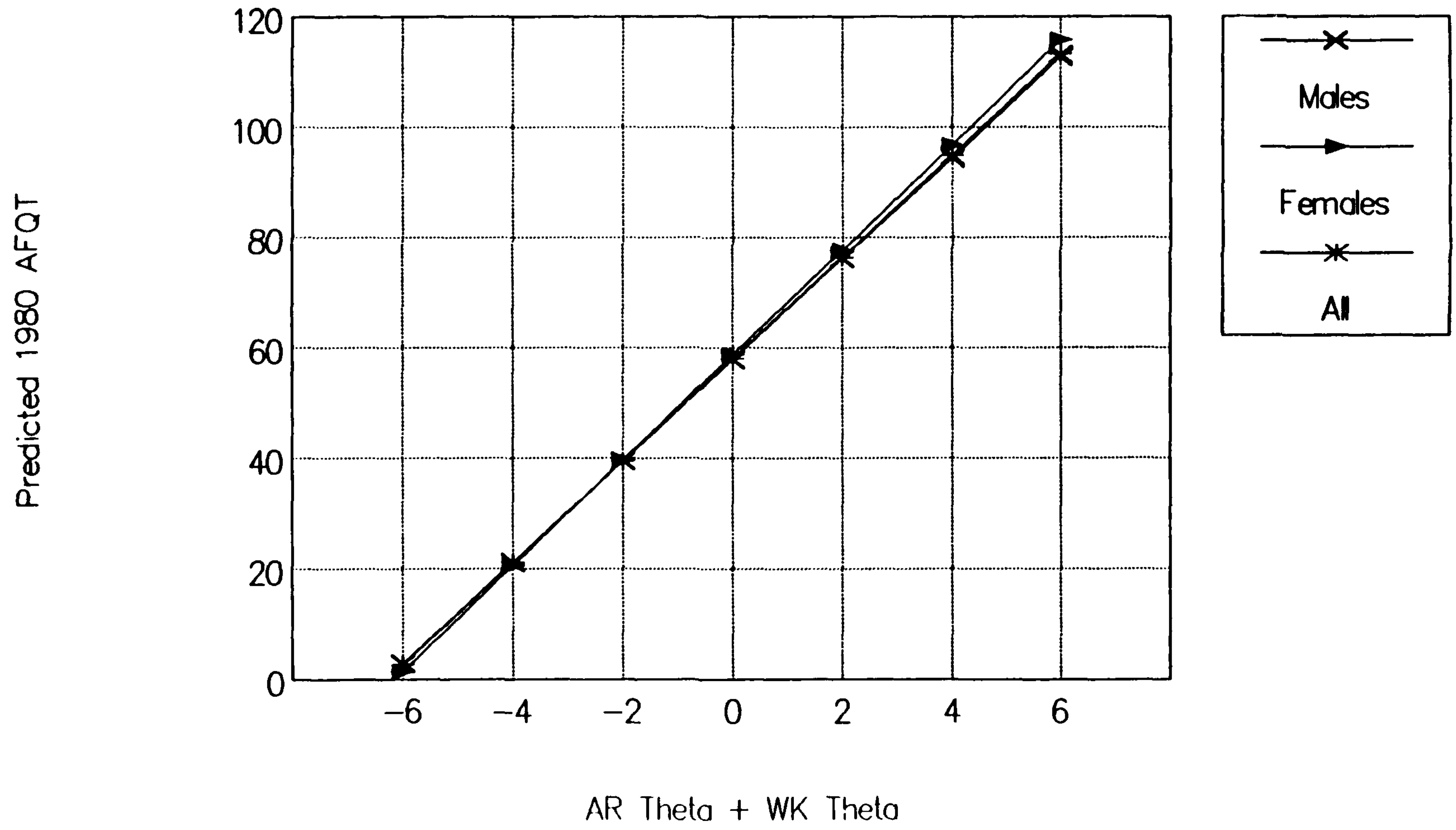


Figure 13

Predicted 1989 AFQT by Gender

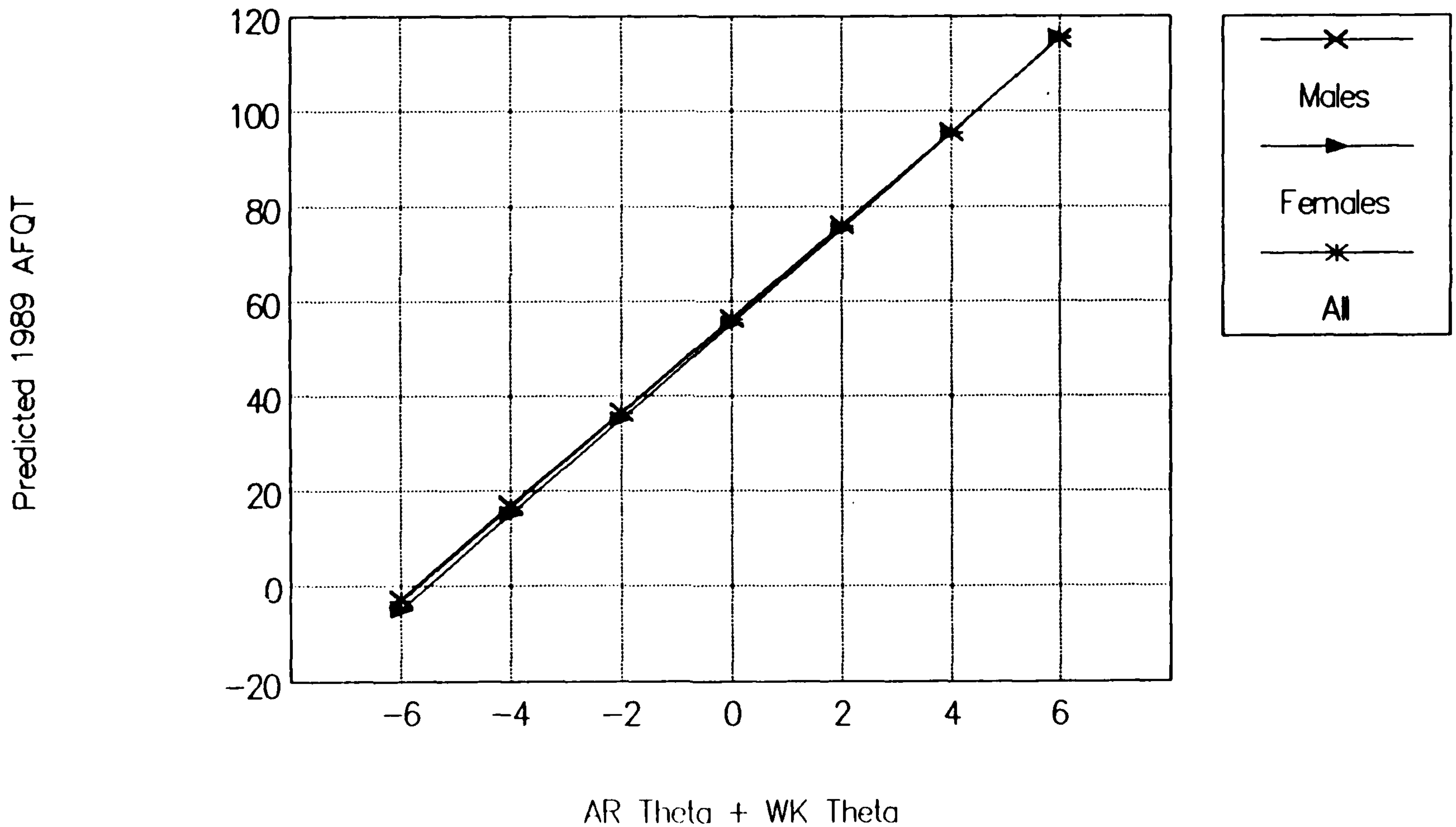


Figure 14

Predicted 1980 AFQT by Race

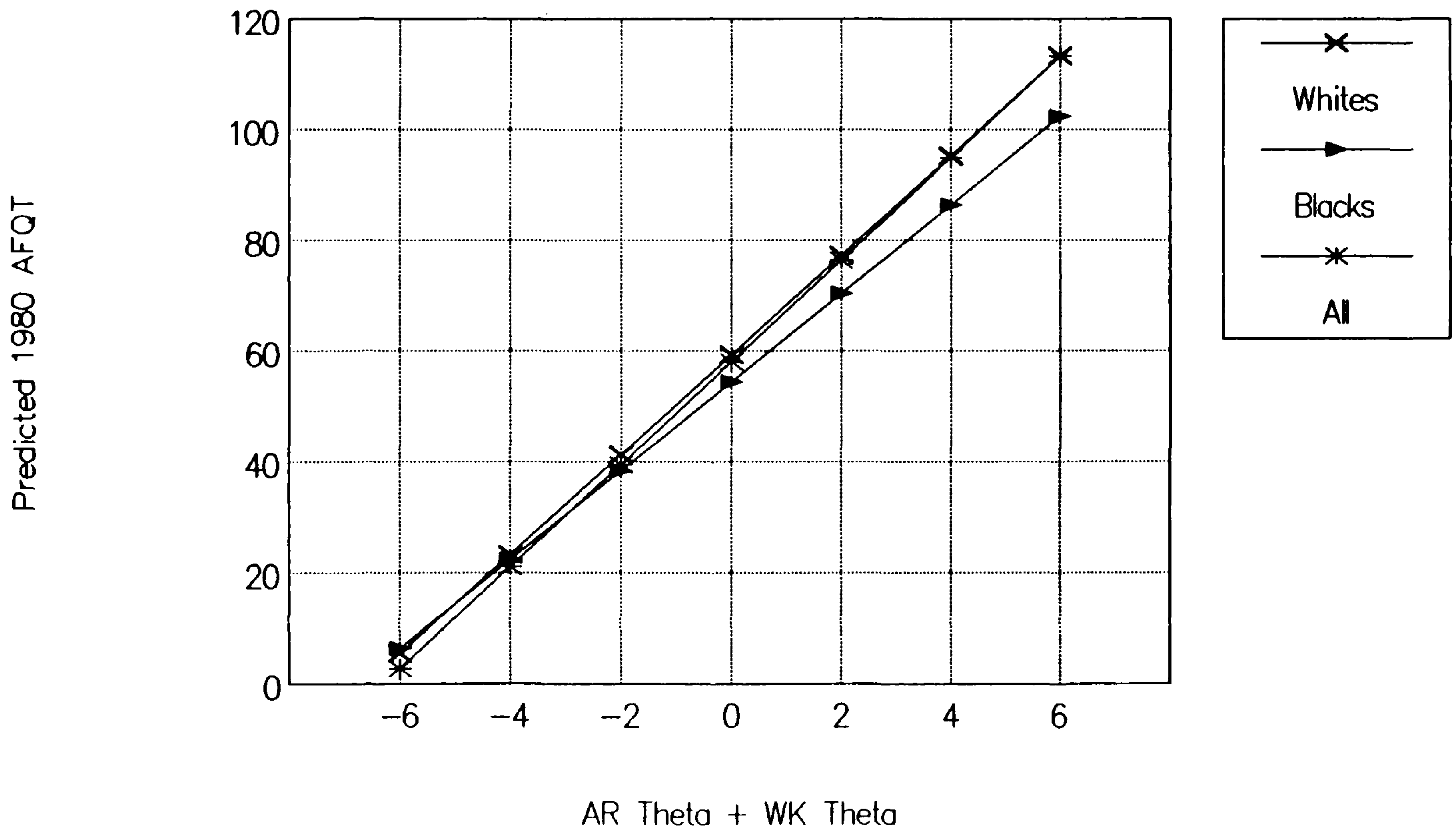
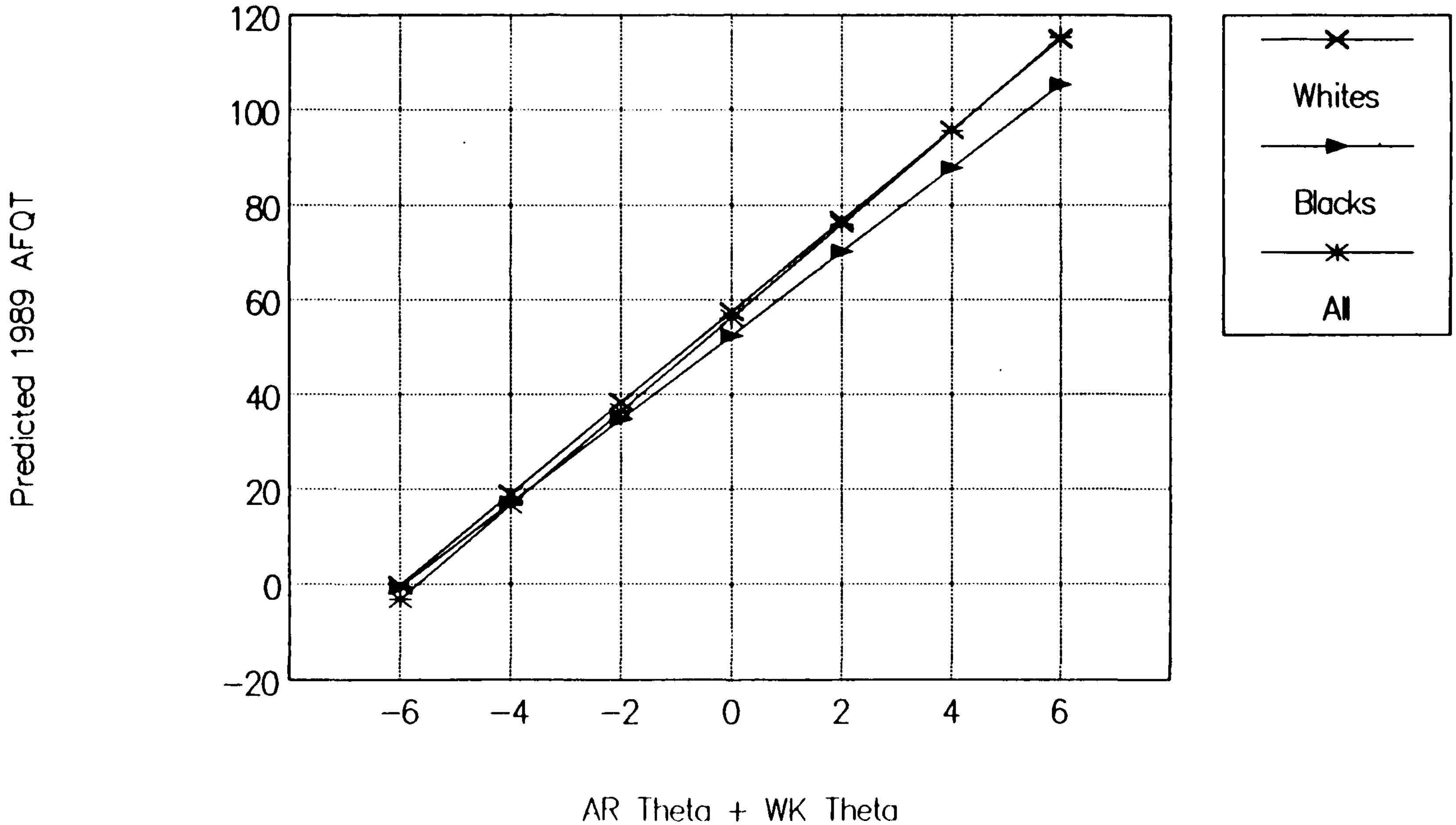


Figure 15

Predicted 1989 AFQT by Race



SCORE REPORTING

The final step in item and score calibration was to develop the equations for predicting the probability of passing critical points on the AFQT. As described above, the final decision regarding score reporting format was to report probability that the examinee would achieve operational ASVAB scores above (or below) critical points. Two points were of primary interest. The first was the 50th percentile. Examinees scoring at or above the 50th percentile are generally eligible for bonuses. Recruiters also have special targets for the number of applicants in this range (Category 1 to 3A) that they recruit. The second point is the 30th percentile. Examinees scoring at or below the 30th percentile are not currently being accepted for most positions.

Prediction equations were required so that CAST could report the candidate's chances of scoring in each range. Logistic regression was selected as the method. It generates predictions that converge to 1.0 for very high ability examinees and converge to zero for very low ability examinees. The primary alternative, (ordinary least squares) regressions analyses, can yield "probability" estimates that are above 1.0 or below 0.

We began with analyses of the Primary Sample examinees. For each examinee, we converted their AR and WK ability estimates to a metric based on the 1980 norm population. Table 49 shows the information used in making these adjustments.

Table 49

ASVAB Subtest and Theta Distributions
for the Primary Sample and the 1980 Norm Population

Subtest	Norm Samp.		Prim Samp.	
	Mean	S.D.	Mean	S.D.
ASVAB-AR	50.00	10.0	52.13	7.32
CAST-AR	0.0	1.0	.213*	.732*
ASVAB-WK	50.00	10.0	52.47	6.02
CAST-WK	0.00	1.0	.247*	.602*

* Derived value

After the theta values (ability estimates) were transformed to have the desired mean and standard deviation, two dichotomous variables were created. Both variables were based on the new AFQT that will become operational in October 1988 (2*VE+MK+AR). The first dichotomous variable, CAT13A, was set to 1 if the new AFQT percentile score was 50 or higher and set to zero otherwise. The second variable, CAT13B, was set to 1 if the new AFQT score was 31 or higher. Table 50 shows the parameter estimates that resulted from a logistic regression analysis with each dichotomous variable regressed against the revised AR and WK thetas.

Table 50

Logistic Regression Parameter Estimates

Criterion	Intercept	WK Coef.	AR Coef.
CAT13A	-0.27	2.57	1.96
CAT13B	2.36	2.00	1.49

Table 51 shows the actual percentage of examinees passing each of the two dichotomous criteria as a function of the predicted probabilities. The match between predicted and actual probabilities of scoring in the 1-3A range is quite good, with most of the actual percentages falling in the prediction range. The match between predicted and actual probabilities of scoring in the 1-3B range is not as good at the low end of the scale (below .35) due largely to the absence of very low scoring examinees in the Primary Calibration Sample.

Table 51

Percentage Passing Each Criterion for Each Predicted Probability Level

Predicted Probability	Actual Number and Percentage Passing			
	CAT 1-3A		CAT 1-3B	
	N	%	N	%
.00-.05	170	18	4	**
.05-.15	176	10	90	73
.15-.25	216	16	59	63
.25-.35	258	21	57	47
.35-.45	410	33	81	46
.45-.55	438	44	148	48
.55-.65	601	54	280	50
.65-.75	1,002	70	559	59
.75-.85	1,237	83	1,254	74
.85-.95	2,447	95	3,786	91
.95-1.00	3,575	100	9,452	100

SOFTWARE REVISION

The second major focus of the CAST Refinement Project, after item development, screening, and calibration, was revision of the software for administering and scoring the test and for reporting and recording the results. As mentioned before, specific objectives included improvement of the score report format, achievement of greater balance in item usage, provision for administration of experimental items, and consideration of changes in the item selection and score estimation strategies.

A review of recent literature was conducted to gather suggestions for or evaluations of potential enhancements. The review of the published literature was supplemented by information on work in progress gathered from interviews of those conducting the work on adaptive testing. Work on the CAT/ASVAB and an Office of Naval Research funded project on adaptive test item calibration were the most relevant ongoing projects. Work by The Psychological Corporation on the adaptive version of the Differential Aptitude Test (DAT) also was found to be quite relevant.

In the remainder of this section, we discuss the major findings from the literature review, the specific proposals for enhancing the CAST software that grew out of these findings, the final decisions reached regarding implementation, and the rationale for these decisions. This discussion is organized by topic as follows: item selection, test starting points, test length and stopping rules, test scoring, reporting test results, seeding and calibration of new items, and item loading strategy. Before turning to these issues, though, we begin with a description of the adaptive testing strategy currently employed by CAST.

Adaptive Testing Strategy Currently Employed by CAST

An adaptive test is one in which the test items are chosen during the test, to match the difficulty of the test to the ability level of the examinee. The set of methods used to choose the items of an individual test is called the adaptive testing strategy. Adaptive testing, and adaptive testing strategies, have been reviewed in some detail elsewhere by Weiss and Betz (1973), Wood (1973), Vale and Weiss (1975), and McBride (1976, 1979).

An adaptive testing strategy encompasses specific criteria and procedures for selecting test items, determining when to stop the test, and for scoring the test. The CAST system currently uses a hybrid strategy in which the items are chosen to maximize local measurement precision, each test stops after a specified number of items have been administered,

and the test is scored using a Bayesian sequential procedure to locate the examinee's ability on a continuous scale of ability. The Bayesian ability estimate is updated after each item. In addition, in order to reduce test compromise, the first five items of each test are chosen at random from a subset of items selected as the best ones for precision of measurement, given the current estimate of the examinee's ability. The size of the candidate item subset is five at the beginning of each test, and is reduced by one after each item is administered.

This strategy has been shown to be a very efficient one, with psychometric properties that rival the performance of the best alternative strategies that have been studied (Wetzel & McBride, 1983, 1984). However, it is not without drawbacks and idiosyncracies. One of these is that the Bayesian ability estimates -- which are updated after each item -- are regressed toward the mean of the Bayesian prior distribution which is specified at the outset of the test. As a consequence, the variance of the ability estimates tends to be smaller than the variance of actual ability; the ability of low ability subjects tends to be overestimated; and the ability of high ability subjects tends to be underestimated.

Another idiosyncracy of the current CAST adaptive testing procedure is that it uses only a small proportion of the test items available in the item bank. In the case of the Arithmetic Reasoning test, less than one-third of the items are ever used. Because only a few items are frequently used, those items are readily susceptible to compromise from overexposure.

These two idiosyncracies may detract from the accuracy of CAST predictions. Efforts to improve them could take one or more directions. For example, the Bayesian ability estimation procedure could be replaced; the specification of the Bayesian prior distribution could be modified; or the CAST item selection rationale could be changed. The following three sections suggest alternatives for consideration, and review relevant research results which are pertinent.

Following the discussion of alternative adaptive testing strategies is a description of issues related to the score reporting format and issues in seeding experimental items during operational use. These discussions are followed by a discussion of improvements in the software for loading and displaying items. Finally, the results of simulations to verify the effectiveness of the revised CAST strategy for reducing the overuse of some items and for improving the accuracy of reported results is described.

Item Selection

In his original proposals for tailored testing, Owen (1969) suggested choosing the one unused item with the minimum pre-posterior risk; i.e., the item with the smallest expected value of the Bayes posterior variance. Urry (e.g., 1983) is a strong proponent of the use of preposterior risk minimization also as the item selection criterion.

This item selection criterion has two important drawbacks. First, it is computation-intensive. Thus, in small computer implementations, item selection computations can be so lengthy as to cause unacceptable delays between items. Second, although item sequences can be pre-computed in order to eliminate these delays, the sequences of item presentations are highly predictable, therefore compromise is virtually inevitable. Fortunately, both drawbacks are correctable.

CAST uses an alternative method for item selection, called the stratified maximum information (STMI) method. The item selection criterion is to maximize the local value of the item information function. In advance of testing, items are arranged in a look-up table referred to as the "information table." The information table has a specified number of rows, corresponding to discrete ability levels at fixed intervals from each other. The information function values are computed for each item, at each of the ability levels; then for each ability level the items are sorted from the largest to the smallest information value, and arranged in that order in the table.

In the current version of CAST, the best 20 items at each ability level are listed in the table. During the test, the ability level closest to the current Bayesian Sequential Estimation (BSE) value is identified, and an item is chosen from the unused items listed in the corresponding row of the table. The first item in both CAST tests is randomly chosen from the locally best five items; after it is administered, the BSE is updated, and the second item is chosen from the first four items in the appropriate row; and so forth. Random selection of items continues until the fifth item in each test; from that point forward, the locally best item is chosen each time.

The purpose of randomly choosing an item from a "nearly best" available subset is to reduce test compromise by eliminating predictable sequences of items. The number of items in the subset to some extent controls item exposure. But there is a tradeoff; the larger the size of the subset of candidate items, the lower the measurement precision of the resulting test.

Wetzel and McBride (1983, 1984) conducted an extensive series of simulation studies aimed at determining the most advantageous methods of adaptive item selection. They compared several of the best known and most promising adaptive testing strategies, and devised a strategy of their own. The strategies studied included: Owen's Bayesian sequential strategy with minimum pre-posterior risk; Maximum Likelihood Estimation (MLE) ability estimation with maximum information item selection; Weiss's STRADAPTIVE (stratified adaptive) strategy; and several others.

From the results obtained, they chose the stratified maximum information (STMI) method for further study. As a result of their simulation study results, STMI is now used in CAST, as well as in the experimental Joint-Service CAT/ASVAB system.

In the simulation studies that followed the adoption of the STMI method, Wetzel and McBride (1984) studied the precision loss resulting from random rather than optimal item selection. They varied the size of the candidate item subsets from 40 items per subset down to one item per subset. They also evaluated the effect of progressively reducing the number of items per subset. The evaluation criteria included test score correlations with known ability and the elevation and shape of the adaptive test information functions.

When the size of the item set was constant, measurement precision was degraded more and more as the size of the item set increased from 1 to 5 to 10 to 20 to 40. This degradation was observed in the test information functions and in the fidelity coefficients (correlations). Random choice of items from sets of size 20 and 40 resulted in substantial degradation of test information; the effect was perhaps tolerable when set size was 10; random selection from item sets of size 5 did not materially degrade precision.

Two different progressively shrinking set sizes were tried as well. The first one started with five items per set, and reduced the set size by one after each of the first four items. After the fifth item the locally optimal item was selected with certainty. The second one started with a set of 10 items, and reduced set size by two after each item; from the fifth to the fifteenth stage, the set size remained two.

In case of the 15-item tests studied by Wetzel and McBride, these two shrinking set size procedures showed no appreciable difference from one another or from the STMI procedure which always chose the one best item. Because of the short test length of CAST, the 5-4-3-2-1 progressively shrinking set size was chosen for use.

Wise (1986) analyzed the frequency of use of all the items in both CAST subtests in a sample of over 14,000 examinees. He found a very unbalanced frequency of item usage, despite the use of random selection early in each adaptive test. In fact, in the case of the CAST Arithmetic Reasoning test, he found that only about 60 of the 225 items had been used at all. Even among the items that were used, there were striking imbalances in usage frequency.

Researchers at the Navy Personnel Research and Development Center (NPRDC) encountered a similar phenomenon in the development of the CAT/ASVAB adaptive testing system. Sympson (1985) devised an item selection procedure that employs a mixed criterion in order to maximize measurement precision while at the same time balancing the frequency of item usage. He demonstrated in simulation studies that his procedure (a) uses more of the items in the item bank, and (b) uses each item less often than randomization strategies such as the one now used in CAST.

Such a procedure would necessarily sacrifice some measurement precision in order to balance item usage frequency. Indeed, Sympson's analysis showed that the resulting test information functions were noticeably lower than the best attainable; but he pointed out that this test information loss had almost negligible consequences in terms of the correlations of test scores with ability. In the example he cites, those correlations were reduced by only two or three points in the third decimal place.

Another issue relevant to this discussion of adaptive test item selection is the impact of item selection criteria on item calibration. At The Educational Testing Service, Stocking is studying the technical problems involved in fitting IRT models to data collected on-line during adaptive testing. She has found that scale distortion is a problem, and that it seems to be attributable in part to the use of item selection criteria that explicitly favor the use of the items with the highest item response model discrimination parameters (personal communication, December 1986).

The implications of Stocking's research may be that less attention should be paid to item discriminating power, both in choosing items for adaptive test item banks and especially in selecting items during the course of adaptive testing. While this issue seems most pertinent to test users who plan to collect data on experimental items by embedding them in adaptive tests, it is germane here because such a practice is being contemplated for CAST.

If this interpretation of Stocking's work is correct, it opens the door to consideration of less optimal item selection criteria than CAST now uses. For example, items could be chosen based on difficulty alone. Or they could be arranged in look-up tables on the basis of difficulty rather than test information. Another alternative would be to consider using the 1-parameter Rasch model, rather than the current 3-parameter logistic model, as the basis for CAST.

Available evidence suggests that current item selection procedures work well, except for the overuse of some items. Before considering strategies to reduce item overuse, a target for the maximum level of use was needed. Currently, six different forms of some ASVAB subtests (the ones used in computing AFQT) and three different forms of other subtests are used operationally so that the exposure of each item is limited to either 17 percent or 33 percent of all ASVAB examinees. A goal of about 20 percent maximum use was proposed for CAST to achieve a level similar to that used in the operational ASVAB.

Sympson's (1985) procedure for limiting item exposure was considered. This procedure associates a selection probability with each item in the bank. It requires extensive simulations to set item parameters and would require significant reprogramming to accommodate the usage parameter for each item. The chief alternative considered was to maintain the current strategy, but to block out from further use all of the items considered in the first several selections rather then just the one that was randomly sampled. This would assure a maximum usage of 20 percent for the best five items in the starting difficulty stratum where usage problems are most acute. (Every examinee starts in this stratum and many return to it; by comparison, very few examinees reach the more extreme strata.) This latter strategy was judged sufficient to reduce overuse of key items and was approved.

A change was also considered and accepted in the construction of the item information table. This table lists the "best" items to pick for each estimated ability level. Currently, the program divides the ability dimension into 35 levels from -2.55 to +2.55 in increments of .15. For each level, the items that maximize information are selected first. Because the slope (discrimination) parameter is closely related to item information, items with high slope estimates tend to be listed first across a range of ability levels. This "multiple listing" of high slope items contributes to the overuse of some items and to the susceptibility to errors of estimate in the item parameters. The proposed alternative was to sort items into ability levels on the basis of their difficulty parameter alone. Within each difficulty level, items would be sorted by

information value. An item would be listed for only one ability level unless there were fewer than 20 items in an adjacent ability level. Where items were listed under additional difficulty levels, they would be listed after all of the items that were initially assigned to the difficulty level. Appendix D shows the revised item information table that was developed using this approach.

Test Starting Points

The current CAST starts each examinee with a prior normal (mean zero, standard deviation one) distribution at the beginning of each of the two subtests. Mislevy (1986) demonstrated the utility of conditioning the prior ability distribution on auxiliary information such as age, years of schooling, and courses taken. In the case of CAST, high school graduation status is certainly of relevance in determining enlistment and bonus qualifications. Mislevy estimates that this type of information can be equivalent to the administration of two to six additional items in reducing errors of estimate.

A second proposal was to condition the prior distribution for AR on the WK estimate. The correlation between AR and WK in the 1980 norming sample is .7. This implies that the distribution of AR scores conditioned on the WK estimate will have roughly one-half less variance in comparison to the unconditional variance in AR scores. As a consequence, fewer AR items would be required to achieve the same level of posterior variance (accuracy).

A number of specific alternatives for demographic variables that might be used to condition the starting points were discussed. In the end, the decision was to retain the current starting point strategy. The concern was that the Bayesian strategy used for ability score estimation tends to bias the estimates toward the starting point (prior mean). If different groups tended to have different starting points, this would introduce a differential bias that would work to someone's disadvantage. While the bias in the overall estimates might be negligible, concern with avoiding even the appearance of unfairness was high.

Test Length and Stopping Rules

Currently, CAST consists of two fixed length adaptive tests. Word Knowledge is 10 items long; Arithmetic Reasoning is 5 items in length. Two potential changes are (a) to adopt a variable length stopping rule, or (b) to change the length of one or both of CAST's component tests. Each of these alternatives is considered in the following paragraphs.

Variable test length. The concept of variable length adaptive tests is both intuitively and theoretically appealing. The idea is to continue administering test items until a pre-specified level of measurement precision has been attained. In the case of the current CAST, this might be operationalized as a critically small value of the Bayes posterior variance. Alternatively, a criterion based on uncertainty in predicted AFQT category scores could be developed. Additional items would be administered for greater accuracy when score estimates were near a critical category boundary (e.g., the 50th percentile dividing AFQT Categories 3A and 3B, the 30th percentile dividing AFQT Categories 3B and 4A).

Despite the intuitive appeal of variable length adaptive testing, none of the current operational implementations of adaptive testing have adopted that stopping rule. ETS and the College Board chose to use fixed test length in their adaptive Computerized Placement Tests, after careful study of the alternatives. The Psychological Corporation's computerized adaptive edition of the Differential Aptitude Tests uses fixed test length. NPRDC's experimental CAT/ASVAB system, as well as the Joint-Service ACAP system, use fixed length adaptive tests. In the development of each of these systems, variable length was considered and rejected.

There has been little research published on the subject. McBride and Martin (1983) reported results for fixed-length Bayesian adaptive tests that were re-scored using a simulated variable length criterion. They found that variable length test termination was not appreciably different from fixed length in terms of the correlation of test scores with an alternate test.

In an unpublished review of published research results, McBride (1976a) evaluated data reported by Urry (1977) and by Vale and Weiss (1975). McBride concluded that their data did not support an interpretation that variable length testing was advantageous compared to fixed length.

At NPRDC, Wetzel and McBride (1983, 1984) designed a series of simulation studies to address the variable length question in more detail. Rebecca Hetter took over this research project and has conducted studies that have not yet been reported. Her results showed no compelling advantage to variable length adaptive tests (personal communication, December 1986).

CAST subtest lengths. CAST's Word Knowledge subtest is twice as long as its Arithmetic Reasoning subtest. Clearly, the resulting AFQT score prediction owes most of its variance to the influence of Word Knowledge. Any gains from changing the relative length of CAST's component tests need to be

balanced against their implications for administration time. Word Knowledge items typically take examinees an average of 20 to 30 seconds; Arithmetic Reasoning items take about three times as long.

The current test appears to be acceptably short. Analysis of prior data suggests that the WK theta estimate has a very high correlation (.78) with the eventual WK subtest score. The AR estimate, however, has a somewhat lower correlation with the eventual AR score (.68). It might be desirable to aim for a correlation of at least .75 for each test. This might mean reducing the WK from 10 to 8 or 9 items and increasing the AR to 7 items, resulting in a net increase in testing time since AR items take two to three times as long as WK items. By conditioning the prior AR distribution on the WK estimate, however, it may be possible to achieve the desired level of accuracy without adding AR items or with the addition of only a single item.

Test length decision. Several factors argued for "fixed length" tests. First, concern has been expressed about the appearance of fairness if one prospect is "rejected" after only a few items while another candidate is given more "chances" and ultimately "accepted." Second, the "uncertainty" statistics are particularly suspect due to errors of estimate in the item parameters and so provide a weak basis for stopping rules. Third, since negative responses generate the most information (positive answers could still be guesses), most of the possible time savings obtained by stopping early would be for examinees who are going to be rejected (and for whom the issue of fairness is most critical). The recruiters do not need additional time (for sales) with the rejects, so the value of saved time is minimal.

The objectives of CAST are somewhat unique in that significantly greater accuracy is required at some points (i.e., near critical AFQT category boundaries) than at others. CAST is primarily a productivity tool for the recruiters, assisting them in allocating their time among prospects. Feedback from the experimental administrations of CAST indicated that recruiters were willing to tolerate increased testing time in exchange for more accurate estimates at critical decision points on the AFQT score continuum. As a consequence, it was decided to modify the fixed length strategy and to administer three additional items for each subtest when the examinee's estimated ability after the current number of items for the subtest are administered was less than .385 (the 65th percentile). This strategy will provide more accurate estimates for marginal examinees without wasting the time of high ability examinees.

Test Scoring

Most adaptive tests in use today are based on item response theory; CAST is among these. Ability estimation comes into play in at least two ways in adaptive tests. These two ways will be referred to as "intermediate" versus "final" ability estimation. Intermediate ability estimation occurs at one or more points during the test; its purpose is to guide item selection, which is based on the values of the intermediate ability estimates. Final ability estimation occurs after the test has been completed; its purpose is to summarize the examinees's performance as a final score.

CAST's hybrid adaptive testing procedure involves computing a Bayesian intermediate ability estimate following each test item; the final score is simply the ability estimate computed after the last test item. This aspect of CAST could be modified in at least two ways: (a) the intermediate ability estimation procedure could be replaced with another procedure; or (b) the final ability estimate could be computed by another method.

At least four different techniques have been developed which could be used for intermediate ability estimation: Bayesian sequential estimation (BSE); Bayesian modal estimation (BME); expected a posteriori (EAP) estimation; and maximum likelihood estimation (MLE). These four different approaches to the same objective can be evaluated in terms of three different criteria: correlations with ability; variance of the estimators; and computational difficulty.

Bayesian sequential and maximum likelihood estimation have been fairly extensively and systematically compared. For example, McBride (1975, 1976b) compared BSE and MLE techniques in a series of computer simulations. Those simulations did not include item parameter estimation errors; the two estimation techniques were compared using actual values of the item parameters. He found that BSE and MLE did not differ appreciably in terms of correlation with known ability, or in terms of precision (defined as Birnbaum's test score information function).

BSE and MLE did differ in terms of the variance of the estimators, and in computational difficulty. The variance of Bayesian sequential ability estimates is generally smaller than the variance of the parameters, and hence BSE tends to be centripetally biased (i.e., biased in the direction of the Bayesian prior mean). The degree of bias is inversely proportional to the number of items administered; it is especially pronounced at short test lengths, such as the 5-item length of the CAST Arithmetic Reasoning test.

In contrast, the variance of MLE ability estimates is generally larger that the variance of the parameters themselves. The MLE estimates tend to be unbiased (i.e., the conditional mean estimators are close to the value of the ability parameters).

McBride found that the advantage of MLE over BSE in terms of bias was offset by computational difficulties of two kinds. The first is the amount of computation that takes place; the second is a susceptibility to convergence failures when iterative numerical techniques are used to approximate the maximum likelihood estimator in practical applications. McBride (1976b) reported that the MLE procedure he studied required more than twice the computing time used for BSE, and convergence failures occurred in about 5 to 10 percent of the MLE computations. Stocking (personal communication, December 1986) indicated that convergence failures during intermediate ability estimation can be minimized or eliminated by using large tolerance values for the convergence criterion. The larger MLE computing time requirements can be reduced by the same technique; alternatively, their effect can be nullified by "time-sharing" with the examinee (i.e., performing the computations while the examinee is reading each test item).

Other investigators have conducted similar simulation studies, and have introduced item parameter estimation error into the investigations as well. Crichton (1979) added random values to item parameters to study the effects of item parameter estimation errors. Wetzel and McBride (1983) simulated reality more closely by using published item calibration computer programs to estimate item parameters whose actual values were known to the investigators. The results were consistent with those of McBride (1976b) as to the psychometric behavior of BSE versus MLE for estimating ability.

In contrast to BSE and MLE, Bayesian modal estimation (BME; Samejima, 1969) has not been extensively studied in comparison with other methods for intermediate adaptive test scoring.

Expected a posteriori (EAP) estimation has only recently come to light, and no systematic comparisons with other methods seem to have been reported. However, Bock and Mislevy (1982) assert that the EAP method has "unusually good properties for computerized adaptive testing." They claim that EAP is simple to compute, is not subject to the convergence problems of iterative techniques, and under certain conditions its estimates have a virtually linear relationship with the actual ability parameter.

Unlike BSE, neither BME nor EAP is affected by the order in which items are administered.

For both BME and EAP, the prior distribution can take any form; this is in contrast to Owen's BSE, which is limited to the use of a normal prior. However, these potential advantages must be weighted against the absence of data about their correlational and measurement precision properties.

In CAST, the final score for each subtest is obtained by updating the Bayesian sequential estimate (BSE) after the last item. As a statistical estimator, that score has the same properties as the intermediate ability estimates discussed in a previous section. The estimates are regressed toward the Bayesian prior mean and have considerably smaller variance than the ability parameters themselves. Another property of the BSE is that it is somewhat order dependent; since it is computed one item at a time, the order of item presentation has some influence on the value of the estimate.

The earlier discussion considered substituting an alternate estimation technique for BSE for the purpose of intermediate ability estimation. Another practice to consider is to re-score the vector of item responses after the test is complete, using a different estimator than the one used for intermediate ability estimation. For example, it seems intuitively desirable for the final score not to depend on the order in which items were administered.

There is some precedent for this in other adaptive testing systems. NPRDC's ACAP system developers are contemplating the use of EAP estimation to produce the final score, after using BSE intermediate ability estimation during the test itself. ETS and the College Board use MLE estimation throughout the Computerized Placement Tests, but they tighten the tolerances after the final item has been administered.

All the estimation techniques discussed in the earlier section on intermediate ability estimation deserve consideration for final ability estimation as well: BSE, BME, EAP, and MLE. Other methods might also be considered. Sympson developed a procedure he calls "weighted by likelihood" estimation, which might be characterized as a Bayesian-motivated maximum likelihood technique. Warm (1985) recently introduced a similar technique called weighted likelihood estimation (WLE).

In considering alternatives for final ability estimation, one should be guided by practical as well as theoretical concerns. Two practical considerations are these: (a) What would be gained by changing the current practice? (b) At what price, in terms of administration time?

The issue of gain is primarily a psychometric one. One might look for gains in correlations, in measurement precision, or in some related psychometric characteristic. However, gains of these kinds will only be appreciable if there is room for significant improvement. The studies of Wetzel and McBride (1983, 1984) indicate that there can be appreciable differences between nearly optimal versus sub-optimal item selection and test scoring methods, but only very small differences among different nearly optimal methods such as BSE and MLE. The same is to be expected for EAP, BME, and WLE methods for final ability estimation: the scores computed using each of these methods can be expected to correlate well above .95 (and often .99) with scores computed with the other methods. The relationship among all these methods can be expected to be monotonic and almost perfect. Gains, if any, will be small ones.

Scoring procedure decision. Current scoring procedures produce acceptable accuracy in predicting AFQT scores. The most significant concern with the current scoring procedure is that ability estimates are biased toward the starting point (zero). So long as each examinee has the same starting point, no differential bias is introduced and the ordering of examinees is not changed by this bias. The reduced variance in the ability estimates is fully compensated for by the use of empirical analyses to derive AFQT estimates. Reduced variance in the ability estimates is matched by increased regression coefficients. Consequently, there was no evidence for significantly greater accuracy in AFQT predictions from alternative scoring procedures and hence no justification for switching to more complex and time-consuming procedures. In the end, the Bayesian sequential scoring strategy was left intact.

Reporting Test Results

The initial proposal for this project called for revision of the reporting format to show estimates of the probability that the examinee will score in each of several AFQT categories when he or she takes the full ASVAB. Currently, the categories of particular interest are:

- above the 50th percentile (AFQT Categories 1 - 3A)
- between the 30th and 50th percentiles (AFQT Category 3B)
- below the 30th percentile (AFQT Categories 4 - 5).

During the course of the project, the U.S Army Recruiting Command (USAREC) reached a decision to modify the existing

reporting format. Rather than showing the likelihood of scoring in each AFQT category, they decided to show confidence bounds for the AFQT percentile estimates. This change was implemented in January 1988.

Subsequent discussions revealed some dissatisfaction with the change in reporting format. The description of the confidence bounds was difficult for both recruiters and prospects to interpret. Consequently, the decision to program the originally intended change was approved in May 1988.

The primary issue in implementing this decision was how best to estimate AFQT category probabilities. Our default approach was to use logistic regression to develop empirical predictions of dichotomous criteria from the CAST AR and WK ability estimates. Two separate dichotomous criteria would be predicted: achievement of a score above the 50th percentile (AFQT Categories 1 - 3A) and achievement of a score at or above the 30th percentile (AFQT Categories (1 - 3B).

Several alternative approaches using the CAST posterior variance estimates were considered. To the extent that errors in the ability estimates are normally distributed (which is likely based on statistical theory), the posterior variance estimates allow one to estimate the probability that true abilities are greater (or less) than estimated abilities by some fixed amount. It should be possible to use the WK and AR error variance estimates to estimate an error variance for a composite of the two subtests used to predict AFQT, and then estimate the probability the true composite value was above or below any given AFQT category boundary.

The problem with the alternative approaches was that the accuracy of the posterior variance estimates was suspect due to failure to account for errors in the item parameter estimates and the known bias of Bayesian estimates. Empirical analyses, confirmed this suspicion. Only minimal correlations were found between the posterior variance estimates and the degree of error in predicting ASVAB AR and WK subtest scores from the CAST estimates. As a consequence, further investigation of alternative approaches to estimating AFQT category probabilities was dropped.

Figure 16 shows the score reporting format selected after review and discussion with the recruiting command. For each of three AFQT categories, empirical data were used to estimate the probability that an examinee will be classified in the category by the operational ASVAB as a function of the CAST WK and AR ability estimates. The development of specific prediction equations is discussed in the previous chapter.

YOUR CAST SCORE ESTIMATES HOW WELL YOU WILL DO ON THE ARMED FORCES QUALIFICATION TEST (AFQT). YOUR SCORE MEANS:

* THERE IS A 75% CHANCE YOU WILL GET AN AFQT SCORE OF 1, 2, OR 3A. A SCORE OF 1-3A MAY QUALIFY YOU FOR ENLISTMENT BONUSES.

* THERE IS A 25% CHANCE YOU WILL GET AN AFQT SCORE OF 3B. A SCORE OF 3B PROBABLY WILL QUALIFY YOU TO ENLIST.

* THERE IS A 0% CHANCE YOU WILL GET AN AFQT SCORE OF 4 OR 5. A SCORE OF 4-5 PROBABLY WILL NOT QUALIFY YOU TO ENLIST.

AFQT	YOUR CHANCES
1-3A	75%
3B	25%
4-5	0%

Figure 16. Revised Score Report

Seeding and Calibration of New Items

Considerations in planning for ongoing updates to the CAST item bank include (a) how often new items should be added to the bank, (b) how many items should be added each time (replacement rate), and (c) how big the calibration samples have to be. These factors, together with an estimate of item screening rates, will determine the number of experimental (nonscored) items to be administered to each prospect taking the operational CAST (or whether all prospects will have to receive experimental items).

In addition to considering how many experimental items each examinee must take, it is necessary to specify how items are assigned to examinees and where the items are placed among the operational items. A default model is that the experimental items available at each site are assigned randomly to examinees and that the position of the item is similarly selected at random. It might be possible, however, to improve upon random assignment. The items might be administered in sequence, for example, so that the first examinee got the

first experimental item, the second examinee got the second, and so on until all the items are used up and the process starts again with the first item. This would assure that each of the items are administered to the same number of examinees insofar as possible and also balance the item samples with respect to testing date.

Where the experimental item is not administered at the beginning of the test, it would be possible to assign the examinees to approximate ability strata on the basis of ability estimates to that point and to cycle the items systematically within each stratum. This would mean that the ability distributions of the examinees receiving different items were as comparable as possible. Even further complexities might be contemplated, such as keeping estimated passing rates for each item and stratum and then selecting experimental items for administration that would lead to the greatest reduction in uncertainty concerning these passing rates.

In developing the experimental version of the revised CAST software, it was decided that at least six experimental items from each subtest would be administered to each examinee. In addition, lower scoring examinees would receive an additional three items of each type so that greater accuracy could be obtained in estimating difficulty and slope parameters for easier items and the guessing parameters for all items. A total of 96 experimental items were accommodated with sequential selection across examinees of the items to be administered so that each item was administered the same number of times. A configuration program was created that allowed for the specification of the number and location of the experimental items to be administered.

In the final version of the revised CAST software, no experimental items are contemplated. Instead, provision was made for administering three additional scored items from each subtest to examinees who, after 10 WK items, are estimated to be below the 65th percentile. This procedure will result in more accurate estimates of AFQT category probabilities.

Item Loading Strategies

One minor problem with the current CAST is that twenty to thirty seconds are required to "initialize" each test. While this was not a problem that we set out to fix, we were nonetheless able to reduce this waiting time significantly, down to five to seven seconds. This reduction was achieved, in part, by a significant compression of the item text files to be loaded and, in part, by a reorganizing of the information to be loaded so that blocks of items with similar difficulty levels could be loaded together.

Simulation of the Final System

A simulation was conducted to evaluate the consequences of the expanded item pool and the revised item selection strategy. The primary criteria used in the evaluation were the frequency of use of each item and the accuracy of score estimates.

The simulation included the following steps:

- describe a sample of hypothetical examinees
- simulate 10 replicate administrations of the CAST to each hypothetical examinee, recording items administered, responses, and score estimates
- evaluate the patterns of item usage
- evaluate the accuracy of the resulting estimates.

Each of these steps is discussed in more detail below prior to presentation of the results.

Construct hypothetical examinee sample. The sample of hypothetical examinees was designed to resemble the 1980 Youth Population estimates as much as possible. Specifically, this meant creating distributions of WK and AR "true" theta values that were normal with mean zero and standard deviation one and had a correlation of about .7. (The CAST item parameters were already scaled with respect to Youth Population estimates.)

A systematic sample rather than a random sample was created. The goal was to cover the complete bivariate distribution of AR and WK as evenly as possible so that CAST accuracy could be evaluated throughout the entire range of abilities. We developed a procedure for identifying a grid of points that had the desired bivariate distribution. (We actually constructed a grid for Z1=AR+WK and Z2=AR-WK; Z1 and Z2 are independent with mean zero and variances of 3.4 and .6 respectively. The grid was 47 by 19 giving a total of 893 points.)

Simulate CAST administration to the hypothetical sample. For each hypothetical examinee, ten replicate administrations of CAST were simulated. The reason for choosing a relatively large sample of hypothetical examinees and a relatively small number of replications for each examinee was to cover the joint distribution space as completely as possible. For each administration, the CAST item selection and scoring procedures were used. For each item selected,

the probability of a correct response was computed using the examinees "true" ability value (theta). The examinee's score for the item was then randomly set to pass or fail with probability equal to the computed probability.

The simulation procedure used the new information table (grouping items primarily on the basis of difficulty and then selecting the most discriminating items within each ability stratum) and blocked out from further use five items for the first item selected, four for the second, etc. It also included administration of three additional items for each subtest if the estimated theta was less than .385 after administration of the normal number of items (10 for WK and 5 for AR).

Evaluation of the results. The first issue addressed in evaluating the results was whether the new procedures were successful in reducing the overuse of items. The current operational version of CAST contains some items that are administered to as many as 68 percent of all examinees. Our target was to reduce this to a maximum percent of around 20.

The number and proportion of times each item was used was computed for all 8930 administrations (ten replications each for 893 examinees). As expected, some items were not administered at all. These items were sufficiently deep in the information table listing for their difficulty level that they were unreachable. Because items deeper in the information table had lower discrimination levels, the nonuse of these items was not a great loss. In all 186 WK items and 73 AR items were used at least once. Table 52 shows frequency of use for these items that were administered at least once.

The results showed a high degree of success in achieving the maximum use target. The success was greatest for WK, where only 3 items were used more than 20 percent of the time (5 were used exactly 20 percent of the time) and the maximum was 23 percent. For AR, 8 items were used more than 20 percent of the time (4 were used exactly 20 percent of the time) and the maximum was 27 percent. The AR items with more than 20 percent usage had low difficulty values. Even after adding 50 new items, the number of very easy items was still small, increasing the tendency for low ability examinees to receive the same items. In practice, however, relatively few very low ability examinees (below the 15th percentile of the norming population) are expected so that actual usage of these items should be less than was obtained in the simulation. In any event, all usage rates were well below 30 percent, representing a vast improvement over current operational results.

Table 52

Frequency of Use of CAST WK and AR Items Based on the Simulation of the Modified Software

Percent of Times Reasoning That the Item was Administered	Word Knowledge N Items	Word Knowledge Pct. Items	Arithmetic N Items	Arithmetic Pct. Items
0 - 4	93	50	21	29
5 - 9	35	19	20	27
10 -14	34	18	16	22
15 -19	16	9	4	6
20 -24	8	4	11	15
25 -29	-	-	1	1
Total	186	100	73	100

The second issue evaluated with the simulation results was the accuracy of the CAST ability estimates. The estimates showed no significant mean bias. As expected, the estimates were biased toward the mean relative to the true values. The standard deviation of the estimates was 74 percent of the standard deviation of the true values for WK and 69 percent for AR.

Because empirical regression analyses were used to develop prediction equations, the most important question was the correlation between the estimated and true AFQT scores. Differences in the scaling of the true and estimated values will be absorbed by differences in regression coefficients. The correlations between the true and estimated scores were .972 for WK and .988 for AR. These results indicate an extremely high degree of accuracy for the revised procedures.

OPPORTUNITIES FOR FURTHER RESEARCH

The CAST Refinement Project was entirely successful in meeting the original objectives for the project. The item pool has been significantly expanded. Both new and old items have been reviewed, screened, and recalibrated. The software has been modified to improve the reports provided to recruiters and prospects, to reduce overuse of particular items, and to improve the accuracy of the results. During the course of the project, a number of opportunities for further CAST research and enhancement efforts were identified. The limited resources of the current project precluded further pursuit of these opportunities, however. In this concluding section, we summarize possible next steps for CAST.

Verify Results of Current Changes

The estimation of AFQT category probabilities for each examinee is based on data collected during the current project. Since the data used in developing these estimates were not based on the revised item pool and item selection strategy, a cross-validation of these results is strongly indicated. Some further adjustments to the estimates or to the instructions to recruiters regarding the use of the estimates may be warranted depending on the results of an operational test and evaluation of the revised system.

A second issue that bears continued monitoring concerns item usage. The simulations used to check item usage were based on assumptions about the distribution of abilities among prospects and on the appropriateness of the item characteristic curves for modeling their responses. As data are collected on the operational use of the revised CAST, it would be prudent to continue to monitor patterns of item usage.

Since the revised CAST software includes provision for collecting item-by-item response information, continued monitoring of CAST results should not require extensive efforts. Recruiters will need to be provided with multiple data diskettes, with instructions for replacing and preserving filled or nearly filled diskettes, and with mailers for returning the full diskettes to ARI.

Examine Test Length/Accuracy Tradeoffs

The revised CAST includes provision for administering three additional items of each type to examinees with scores in the critical range (e.g., estimated AFQT at or below the 65th percentile). There is a need for further monitoring of

the tradeoff between additional testing time and the accuracy of the AFQT category predictions. The issues here are partly empirical (e.g., how much greater accuracy is achieved as additional items are added). The issues also are partly perceptual (e.g., how much of a burden do recruiters perceive the extra testing time to be, how much do they perceive and value the greater accuracy associated with the increased testing).

It should be possible to survey a sample of recruiters 6 to 12 months after implementation of the revised CAST to assess their perception concerning the time/accuracy tradeoffs and also to gain further suggestions for useful enhancements.

Automate Analysis and Screening of Experimental Items

The current project provided a mechanism for administering experimental items as part of the operational CAST. A next step might be to develop software and procedures for accumulating the data recorded by the revised CAST and for analyzing and screening the experimental items. The system used in the current project was highly dependent on the availability of SAS for most processing. Many procedures (e.g., item bias screening) were developed for the paper-and-pencil administration and will need revision for use with the CAST-administered data.

Develop an Appropriateness Screen

There may be numerous situations when individual results are inconsistent and should not be interpreted because of motivational, mechanical, or other problems. The current item selection and scoring strategy will always provide an AFQT estimate, regardless of the degree of inconsistency in the examinee's responses. It may prove beneficial to develop an index to identify random responders and unlikely response patterns and to modify the software to print a message for recruiters alerting them to the problem.

Convert CAST Software for the EIDS System

The JOIN System now used to administer CAST will be replaced in the near future by EIDS. It seems likely that further modifications to the CAST software will be required at that time. There will undoubtedly be a number of opportunities associated with the change in hardware. For example, the use of lower case letters in the text of test items is an issue that will need to be studied at that time.

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Appendix A

Frequency of Item Use in Supplemental Sample

Word Knowledge Items			Arithmetic Reasoning Items		
Item #	Scored	Exp.	Item #	Scored	Exp
4	0	308	2	0	270
7	0	270	3	0	258
9	0	336	5	0	311
17	0	300	6	0	368
21	0	309	7	0	246
24	0	281	8	0	277
28	0	285	10	0	258
30	0	239	11	0	315
31	0	275	14	0	261
33	0	281	16	0	236
35	0	393	18	0	336
40	0	294	19	0	308
45	0	306	20	0	258
47	0	273	23	0	313
50	0	368	25	0	327
53	0	327	27	0	393
58	0	285	28	0	314
59	0	368	29	0	309
60	0	258	34	0	300
63	0	308	35	0	275
66	0	393	36	0	303
68	0	368	38	0	245
71	0	294	39	0	285
72	0	313	41	0	253
73	0	336	42	0	281
76	0	253	45	0	306
78	0	253	46	0	307
79	0	307	47	0	294
83	0	281	48	0	281
85	0	236	49	0	273
86	0	246	50	0	239
88	0	306	52	1692	313
89	0	236	53	0	258
90	0	277	66	0	294
92	0	300	69	9	0
93	0	261	80	0	270
96	0	281	84	27	303
103	0	309	85	0	277
105	0	280	86	0	258
107	0	258	88	0	279
108	0	245	91	0	245
109	0	239	95	0	294

Frequency of Item Use in Supplemental Sample

Word Knowledge Items			Arithmetic Reasoning Items		
Item #	Scored	Exp.	Item #	Scored	Exp
110	0	316	99	0	258
112	0	316	102	0	300
115	0	258	103	0	327
119	0	246	107	0	311
126	0	258	112	0	336
129	0	393	116	0	258
130	0	303	122	0	336
131	0	270	124	0	306
132	0	258	128	0	239
133	0	307	129	0	393
136	0	314	139	0	315
137	0	275	144	0	306
141	0	327	149	0	315
143	0	307	157	0	281
145	0	277	161	0	307
146	0	261	165	0	273
154	0	245	168	0	309
155	0	281	173	14	261
157	0	239	175	0	314
159	0	273	180	0	261
160	0	306	182	0	308
162	0	253	185	0	327
164	0	258	186	161	281
165	0	300	189	0	277
166	0	308	192	0	236
167	0	275	194	146	0
174	0	245	199	0	307
176	0	303	202	0	253
179	0	280	203	0	270
180	0	261	204	249	246
181	0	336	205	127	0
182	0	273	207	3	281
183	0	314	208	1066	0
186	0	311	209	981	0
188	0	313	210	638	0
191	0	311	211	0	246
196	0	294	215	0	285
197	2	285	216	0	245
198	11	0	217	1849	393
205	1082	0	218	0	239

Frequency of Item Use in Supplemental Sample

Word Knowledge Items			Arithmetic Reasoning Items		
Item #	Scored	Exp.	Item #	Scored	Exp
206	39	0	220	263	258
207	83	327	221	0	236
208	0	246	223	662	0
212	0	258	224	806	0
215	357	0	228	1278	0
216	1239	0	230	0	253
218	500	313	231	385	300
219	1938	0	234	0	303
220	357	0	238	0	313
221	1057	0	240	0	273
222	980	0	242	0	309
223	740	0	243	0	308
224	299	0	245	0	281
225	881	0	247	934	0
226	1668	0	249	0	368
227	1737	0	250	475	0
228	2351	0	251	273	0
229	349	0	252	2082	0
230	18	281	253	0	275
231	332	0	254	0	285
232	62	0	256	1937	0
233	1060	0	264	112	0
234	241	0	271	1157	0
235	1321	0	272	0	314
236	334	309	275	0	258
237	152	0			
238	540	0			
239	11	0			
240	797	0			
242	2	0			
244	642	0			
245	528	258			
246	82	314			
247	568	0			
248	0	316			
251	1742	0			
252	0	236			
253	605	0			
254	1679	0			
255	79	0			
256	2316	0			

Frequency of Item Use in Supplemental Sample

Word Knowledge Items			Arithmetic Reasoning Items		
Item #	Scored	Exp.	Item #	Scored	Exp
257	964	0			
258	1	0			
259	757	0			
260	307	277			
261	16	270			
262	154	0			
263	41	0			
265	1549	280			
266	1591	0			
267	2464	0			
268	433	311			
270	238	0			
271	0	303			
272	0	258			
274	1624	0			
275	217	0			
389	1	0			
390	1	0			
399	1	0			
TOTAL	39140	27843	TOTAL	19565	27837

Appendix B

Item Statistics

For Separate CAST Arithmetic Reasoning and Word Knowledge Forms

Note: Forms 1-6 Forward; Forms 7-12 Reverse

Source of item	(S)	Position of item	(Pos)
Master number	(Num)		
Percent correct	(PctCor)	Biserial corr	(Bis)
BILOG *a* estimates	(a)	LOGIST *a* estimates	(a)
b "	(b)	*b* "	(b)
c "	(c)	*c* "	(c)
Race bias chi-sq	(chi-sq)	Sex bias chi-sq	(chi-sq)

CAST Arithmetic Reasoning Item Statistics Separate Form 1

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	AR193	0.245	0.332	2.026	1.666	0.160	1.285	1.562	0.160	-12.034	-6.587
N	2	AR021	0.949	0.469	1.064	-3.028	0.157	0.591	-3.566	0.143	-0.058	-0.093
O	3	AR101	0.268	0.474	1.851	1.306	0.120	1.212	1.178	0.117	0.009	1.967
O	4	AR173	0.877	0.629	1.650	-1.608	0.104	1.162	-1.512	0.143	2.356	3.511
N	5	AR010	0.863	0.617	1.696	-1.439	0.143	1.191	-1.376	0.143	-1.180	-0.176
N	6	AR033	0.257	0.311	1.886	1.717	0.171	1.111	1.623	0.168	-0.047	1.141
N	7	AR028	0.819	0.576	1.520	-1.166	0.177	1.056	-1.142	0.143	0.473	2.786
O	8	AR224	0.408	0.465	1.972	0.927	0.219	1.154	0.795	0.195	0.476	3.305
O	9	AR208	0.814	0.556	1.437	-1.264	0.114	1.017	-1.157	0.143	-1.886	-1.735
O	10	AR107	0.183	0.288	1.558	2.024	0.111	0.970	1.931	0.109	-9.298	3.875
N	11	AR041	0.496	0.557	1.564	0.307	0.135	1.028	0.209	0.117	2.084	-3.710
O	12	AR226	0.445	0.530	1.413	0.411	0.080	0.911	0.333	0.076	-0.214	-2.057
O	13	AR172	0.178	0.452	1.938	1.611	0.070	1.083	1.560	0.069	13.258	1.720
O	14	AR213	0.628	0.555	1.412	-0.318	0.116	1.005	-0.273	0.143	8.214	1.678
O	15	AR071	0.300	0.387	1.574	1.388	0.153	0.959	1.273	0.147	0.706	2.181
O	16	AR077	0.358	0.329	2.088	1.372	0.247	1.222	1.279	0.241	0.514	-4.286
N	17	AR026	0.328	0.394	1.754	1.339	0.190	1.114	1.199	0.183	-0.072	0.597
O	18	AR154	0.411	0.278	0.750	1.327	0.170	0.469	1.071	0.143	8.887	0.077
O	19	AR260	0.310	0.496	1.481	1.001	0.073	0.892	0.895	0.064	0.156	-9.416
N	20	AR018	0.481	0.618	2.199	0.368	0.155	1.403	0.275	0.136	1.475	-0.424
O	21	AR257	0.459	0.455	1.297	0.556	0.150	0.802	0.438	0.126	-7.199	-0.513
O	22	AR194	0.787	0.586	1.533	-0.972	0.184	1.081	-0.956	0.143	-2.360	0.587
N	23	AR035	0.582	0.558	1.637	0.038	0.182	1.115	-0.006	0.176	-2.009	-0.444
O	24	AR086	0.466	0.560	1.498	0.362	0.105	0.994	0.274	0.092	14.251	21.785
O	25	AR122	0.498	0.529	1.632	0.399	0.178	1.071	0.296	0.157	-2.389	1.460
O	26	AR184	0.194	0.416	2.071	1.643	0.103	1.176	1.549	0.093	-2.896	4.581
O	27	AR124	0.147	-0.110	0.174	11.192	0.040	2.154	7.704	0.146	1.503	1.490
O	28	AR229	0.356	0.453	2.290	1.133	0.215	1.331	0.993	0.191	2.509	2.399
O	29	AR090	0.189	0.269	3.757	1.832	0.152	1.840	1.742	0.142	-1.422	3.915
O	30	AR052	0.545	0.634	2.146	0.155	0.180	1.443	0.085	0.156	1.706	0.507
O	31	AR160	0.392	0.564	1.876	0.674	0.126	1.176	0.557	0.103	-0.789	-5.659
O	32	AR151	0.371	0.431	1.755	1.098	0.208	1.061	0.956	0.178	1.344	-1.951
O	33	AR197	0.508	0.547	1.790	0.381	0.211	1.218	0.299	0.181	11.547	-0.071
O	34	AR243	0.407	0.594	2.544	0.696	0.184	1.557	0.588	0.157	1.352	2.266
O	35	AR175	0.442	0.578	1.755	0.413	0.119	1.194	0.373	0.108	-10.272	-20.034
O	36	AR066	0.651	0.595	1.686	-0.382	0.177	1.199	-0.288	0.167	3.149	-5.367
N	37	AR013	0.627	0.480	1.137	-0.298	0.198	0.803	-0.279	0.143	-1.853	-1.694
O	38	AR268	0.223	0.214	1.921	2.145	0.187	1.117	2.029	0.172	-1.769	1.290
O	39	AR098	0.318	0.564	2.451	0.982	0.153	1.541	0.890	0.132	-0.227	2.472
O	40	AR199	0.433	0.575	1.825	0.495	0.157	1.230	0.468	0.133	5.755	0.049
O	41	AR246	0.405	0.436	1.825	0.965	0.256	1.178	0.892	0.218	-3.015	-4.247
O	42	AR064	0.228	0.310	2.629	1.705	0.185	1.468	1.626	0.159	5.689	4.158
O	43	AR244	0.347	0.495	2.055	1.011	0.203	1.330	0.960	0.172	3.355	3.896
O	44	AR202	0.247	0.448	1.812	1.379	0.132	1.240	1.303	0.119	0.631	4.261
N	45	AR023	0.404	0.520	1.880	0.626	0.185	1.205	0.671	0.159	1.819	-4.178
O	46	AR134	0.198	0.319	2.733	1.745	0.162	1.600	1.674	0.138	7.033	6.734
O	47	AR267	0.207	0.296	2.102	1.857	0.172	1.403	1.741	0.147	7.355	-0.679
O	48	AR170	0.133	0.229	3.676	1.980	0.125	2.104	1.917	0.103	7.407	-0.125
O	49	AR203	0.230	0.417	1.813	1.446	0.135	1.213	1.419	0.118	3.378	2.235
O	50	AR223	0.277	0.458	2.150	1.174	0.171	1.385	1.206	0.147	-1.352	-1.304

CAST Arithmetic Reasoning Item Statistics Separate Form 2

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
0	1	AR265	0.339	0.181	1.847	2.218	0.301	1.074	2.296	0.299	-3.615	1.261
0	2	AR129	0.445	0.531	1.880	0.631	0.187	0.970	0.541	0.164	19.440	15.185
0	3	AR214	0.676	0.416	1.145	-0.201	0.281	0.550	-0.676	0.155	-0.302	0.722
0	4	AR091	0.401	0.549	1.891	0.757	0.161	1.078	0.705	0.159	6.869	-0.423
0	5	AR116	0.317	0.458	1.579	1.105	0.122	0.777	1.158	0.114	13.106	11.159
0	6	AR231	0.370	0.450	1.454	1.002	0.157	0.768	0.990	0.147	1.302	4.191
0	7	AR268	0.220	0.273	1.383	2.192	0.145	0.672	2.428	0.140	-0.330	3.993
0	8	AR180	0.502	0.455	1.241	0.455	0.181	0.652	0.335	0.155	-2.164	-5.370
0	9	AR211	0.812	0.561	1.542	-1.125	0.148	0.885	-1.319	0.155	0.421	0.024
0	10	AR139	0.672	0.486	1.184	-0.551	0.118	0.659	-0.635	0.155	0.488	0.062
0	11	AR084	0.201	0.260	2.190	2.136	0.162	1.340	2.245	0.160	2.706	10.702
N	12	AR030	0.894	0.551	1.869	-1.605	0.100	0.735	-2.425	0.155	-0.883	-3.515
N	13	AR017	0.929	0.543	1.945	-1.873	0.139	0.598	-3.633	0.155	-0.324	-1.608
0	14	AR204	0.253	0.346	1.981	1.706	0.170	1.084	1.796	0.171	2.455	3.283
0	15	AR195	0.746	0.537	1.362	-0.768	0.185	0.839	-0.914	0.155	3.488	0.182
0	16	AR080	0.261	0.413	2.285	1.508	0.167	1.269	1.543	0.164	2.564	-0.868
0	17	AR236	0.679	0.470	1.204	-0.614	0.102	0.650	-0.683	0.155	-7.955	-3.794
0	18	AR066	0.725	0.618	1.874	-0.610	0.140	1.156	-0.696	0.156	0.198	-2.098
0	19	AR186	0.330	0.562	2.228	0.905	0.127	1.208	0.898	0.127	5.363	0.060
0	20	AR189	0.340	0.279	1.240	1.900	0.238	0.564	1.915	0.206	0.593	0.105
N	21	AR029	0.570	0.469	1.482	0.339	0.271	0.826	0.285	0.274	-1.109	-1.142
N	22	AR046	0.231	0.458	3.106	1.453	0.142	1.885	1.486	0.148	3.269	7.503
0	23	AR185	0.301	0.382	1.311	1.467	0.145	0.650	1.470	0.122	-14.933	-2.980
N	24	AR027	0.262	0.296	1.645	1.956	0.190	0.906	2.026	0.186	-0.469	-6.591
0	25	AR168	0.319	0.381	1.651	1.423	0.194	0.811	1.493	0.179	-1.720	2.837
0	26	AR144	0.345	0.461	1.914	1.119	0.188	0.992	1.105	0.170	1.128	3.640
0	27	AR247	0.303	0.469	2.509	1.318	0.198	1.470	1.248	0.182	8.449	6.402
0	28	AR128	0.431	0.564	2.485	0.706	0.227	1.353	0.639	0.204	-1.681	0.134
N	29	AR049	0.332	0.536	2.712	1.047	0.191	1.467	1.006	0.173	4.468	5.121
0	30	AR200	0.314	0.566	2.690	0.980	0.153	1.463	0.957	0.139	-0.864	1.270
0	31	AR112	0.394	0.382	1.537	1.315	0.269	0.847	1.289	0.247	-0.476	-1.691
0	32	AR149	0.196	0.540	2.622	1.416	0.096	1.466	1.450	0.089	0.373	2.207
0	33	AR192	0.275	0.448	2.042	1.398	0.173	1.125	1.386	0.149	-5.020	0.333
0	34	AR099	0.190	0.431	2.758	1.665	0.126	1.503	1.715	0.115	4.156	1.250
0	35	AR137	0.618	0.588	1.879	-0.097	0.255	1.261	-0.074	0.238	1.205	-1.241
0	36	AR220	0.319	0.655	2.118	0.680	0.068	1.260	0.658	0.046	-2.067	-3.968
0	37	AR070	0.246	0.337	3.046	1.756	0.213	1.684	1.769	0.186	-0.622	8.716
0	38	AR242	0.426	0.523	2.079	0.756	0.259	1.287	0.730	0.217	1.118	-1.044
0	39	AR085	0.406	0.504	1.951	0.869	0.253	1.191	0.810	0.204	5.396	0.048
0	40	AR165	0.269	0.473	2.413	1.353	0.186	1.355	1.334	0.151	-5.535	-2.120
N	41	AR041	0.337	0.584	2.089	0.844	0.162	1.376	0.813	0.127	6.418	0.382
0	42	AR196	0.375	0.535	2.719	0.931	0.264	1.745	0.870	0.209	-2.588	0.935
N	43	AR013	0.519	0.473	1.190	0.201	0.236	0.923	0.430	0.241	0.072	-9.622
0	44	AR161	0.492	0.606	1.878	0.150	0.191	1.312	0.249	0.154	-2.377	-12.205
N	45	AR004	0.618	0.560	1.366	-0.596	0.156	1.068	-0.050	0.248	-3.894	-17.186
N	46	AR047	0.360	0.582	1.847	0.637	0.150	1.176	0.694	0.108	5.783	0.634
0	47	AR095	0.228	0.266	1.850	2.148	0.215	0.924	2.245	0.167	0.012	9.207
0	48	AR182	0.271	0.565	2.051	1.019	0.132	1.177	1.066	0.089	1.424	6.047
0	49	AR103	0.350	0.558	1.559	0.564	0.103	0.980	0.710	0.079	5.901	1.460
0	50	AR246	0.322	0.411	1.851	1.269	0.251	1.011	1.357	0.189	2.109	3.870

CAST Arithmetic Reasoning Item Statistics Separate Form 3

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	AR041	0.514	0.521	1.469	0.275	0.155	0.752	0.069	0.082	9.860	1.992
O	2	AR270	0.833	0.426	0.919	-1.706	0.196	0.418	-2.499	0.108	2.988	-0.041
O	3	AR120	0.253	0.465	2.359	1.337	0.128	1.258	1.328	0.120	2.886	18.257
O	4	AR132	0.468	0.469	1.266	0.410	0.116	0.671	0.295	0.078	7.752	0.004
O	5	AR181	0.628	0.514	1.359	-0.297	0.135	0.781	-0.394	0.108	-3.920	-8.013
O	6	AR059	0.472	0.582	1.733	0.335	0.118	0.942	0.225	0.080	3.904	-0.120
N	7	AR015	0.433	0.414	1.706	0.901	0.233	0.860	0.857	0.211	-2.058	0.259
O	8	AR074	0.333	0.411	2.219	1.252	0.207	1.125	1.255	0.192	-2.696	7.882
N	9	AR042	0.645	0.517	1.473	-0.192	0.217	0.729	-0.500	0.108	-0.401	-2.698
O	10	AR183	0.339	0.546	1.750	0.854	0.095	0.903	0.770	0.062	0.896	11.003
O	11	AR096	0.234	0.465	2.453	1.369	0.120	1.326	1.406	0.116	9.258	7.458
O	12	AR125	0.671	0.696	2.411	-0.340	0.172	1.576	-0.425	0.132	6.632	2.621
N	13	AR016	0.680	0.589	1.595	-0.533	0.117	0.986	-0.587	0.108	5.026	-0.061
O	14	AR179	0.541	0.630	1.999	0.028	0.107	1.211	-0.028	0.094	3.415	5.426
O	15	AR127	0.224	0.238	1.786	2.107	0.170	0.851	2.294	0.160	0.235	16.700
O	16	AR066	0.755	0.607	1.701	-0.892	0.092	1.064	-0.917	0.108	-1.313	-5.709
O	17	AR219	0.526	0.543	1.659	0.228	0.164	0.957	0.138	0.140	3.866	4.006
O	18	AR138	0.329	0.505	1.702	0.957	0.112	0.949	0.936	0.101	-0.152	-2.308
O	19	AR239	0.577	0.504	1.306	-0.008	0.156	0.711	-0.169	0.108	1.018	-4.192
O	20	AR148	0.309	0.346	1.419	1.512	0.175	0.748	1.542	0.161	-4.250	1.043
O	21	AR110	0.445	0.536	1.991	0.668	0.206	1.190	0.586	0.187	10.592	8.547
N	22	AR036	0.588	0.547	1.589	-0.001	0.185	0.882	-0.138	0.139	-4.573	-2.127
O	23	AR111	0.235	0.521	1.648	1.284	0.066	0.884	1.265	0.046	9.491	10.291
O	24	AR123	0.206	0.453	1.689	1.551	0.081	0.816	1.609	0.061	-8.188	0.540
O	25	AR087	0.180	0.261	1.840	2.113	0.128	0.935	2.266	0.120	4.678	3.534
O	26	AR266	0.336	0.389	1.357	1.245	0.158	0.716	1.250	0.140	1.567	9.952
O	27	AR102	0.645	0.621	1.782	-0.272	0.184	1.051	-0.388	0.124	6.003	7.615
O	28	AR147	0.433	0.484	1.715	0.789	0.218	0.865	0.659	0.162	-1.760	5.560
O	29	AR249	0.323	0.338	1.844	1.505	0.225	1.040	1.515	0.214	-0.989	2.295
O	30	AR268	0.226	0.244	1.536	2.215	0.172	0.898	2.257	0.166	-2.629	3.149
O	31	AR222	0.537	0.552	1.711	0.229	0.212	1.081	0.223	0.199	0.777	-2.524
O	32	AR164	0.360	0.309	1.262	1.567	0.239	0.654	1.559	0.207	0.300	0.804
N	33	AR011	0.752	0.571	1.494	-0.901	0.195	0.834	-0.990	0.108	-4.048	-7.829
O	34	AR269	0.624	0.482	1.125	-0.360	0.169	0.640	-0.426	0.108	-2.303	-8.057
O	35	AR274	0.397	0.564	1.834	0.632	0.148	1.143	0.637	0.130	0.426	-0.721
O	36	AR073	0.371	0.425	1.779	1.142	0.238	1.078	1.146	0.215	1.496	0.488
O	37	AR225	0.382	0.457	1.951	0.964	0.227	1.269	0.978	0.210	0.782	-0.095
O	38	AR163	0.260	0.235	2.519	1.845	0.228	1.531	1.858	0.206	-0.242	-5.749
O	39	AR126	0.411	0.553	2.022	0.584	0.183	1.330	0.664	0.171	5.754	1.294
N	40	AR024	0.481	0.531	1.322	0.083	0.098	0.714	0.119	0.039	0.966	-6.977
O	41	AR145	0.409	0.537	1.575	0.450	0.132	0.955	0.614	0.122	-1.788	-16.746
O	42	AR055	0.308	0.446	2.633	1.167	0.219	1.712	1.227	0.189	2.755	-1.143
O	43	AR246	0.375	0.421	1.637	0.997	0.242	1.181	1.147	0.229	-3.086	-1.453
O	44	AR191	0.278	0.392	2.245	1.358	0.206	1.511	1.458	0.183	-1.988	-0.328
O	45	AR067	0.387	0.502	1.701	0.618	0.178	1.109	0.858	0.177	-1.696	0.937
N	46	AR013	0.471	0.390	1.464	0.642	0.312	1.058	1.026	0.318	-0.717	-9.708
N	47	AR032	0.160	0.400	2.511	1.668	0.117	1.562	1.803	0.094	-4.224	-3.715
O	48	AR136	0.146	0.229	3.126	2.054	0.141	2.000	2.206	0.117	-3.626	3.490
O	49	AR146	0.322	0.360	1.597	1.228	0.231	1.054	1.475	0.208	-2.052	-7.308
N	50	AR019	0.441	0.359	1.301	0.644	0.279	0.928	1.174	0.293	1.503	-1.495

CAST Arithmetic Reasoning Item Statistics Separate Form 4

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	AR022	0.448	0.527	1.865	0.628	0.186	1.084	0.571	0.175	2.460	6.427
0	2	AR153	0.224	0.226	1.920	2.116	0.184	0.936	2.258	0.169	2.459	1.713
0	3	AR065	0.301	0.294	1.569	1.690	0.200	0.907	1.731	0.202	0.424	3.361
0	4	AR176	0.367	0.558	1.721	0.718	0.096	1.013	0.668	0.081	-0.016	0.428
N	5	AR008	0.413	0.297	1.058	1.335	0.232	0.580	1.361	0.227	1.224	-0.702
0	6	AR058	0.741	0.488	1.163	-0.933	0.136	0.653	-1.048	0.134	0.606	-1.254
0	7	AR068	0.443	0.556	2.052	0.563	0.169	1.125	0.496	0.145	0.503	0.666
0	8	AR233	0.805	0.600	1.565	-1.162	0.113	0.967	-1.191	0.134	-0.574	-0.925
0	9	AR094	0.428	0.532	1.823	0.713	0.181	1.094	0.627	0.163	-0.971	1.418
N	10	AR006	0.889	0.588	1.713	-1.635	0.144	0.899	-1.939	0.134	-0.745	-0.073
0	11	AR066	0.780	0.614	1.721	-0.952	0.136	1.057	-0.997	0.134	0.333	-3.468
0	12	AR152	0.223	0.210	2.963	1.843	0.178	1.683	1.867	0.176	1.886	9.621
0	13	AR063	0.278	0.284	1.341	1.762	0.168	0.693	1.830	0.153	-3.919	-5.042
0	14	AR246	0.485	0.411	1.548	0.757	0.261	0.778	0.634	0.219	-4.779	-4.539
0	15	AR105	0.636	0.581	1.527	-0.403	0.086	0.939	-0.434	0.081	-0.207	-1.636
0	16	AR156	0.535	0.602	1.906	0.131	0.146	1.106	0.056	0.117	8.630	4.360
0	17	AR241	0.543	0.487	1.482	0.317	0.221	0.918	0.298	0.224	-0.530	-0.170
N	18	AR025	0.753	0.665	2.031	-0.758	0.136	1.203	-0.881	0.076	4.803	-8.645
0	19	AR167	0.272	0.496	2.392	1.189	0.131	1.384	1.165	0.121	-0.308	1.723
0	20	AR114	0.319	0.381	2.284	1.334	0.211	1.245	1.332	0.199	-2.701	5.114
0	21	AR255	0.537	0.516	1.664	0.353	0.231	1.026	0.294	0.218	4.148	-1.631
0	22	AR240	0.538	0.562	1.803	0.293	0.214	1.079	0.216	0.193	4.038	3.788
0	23	AR258	0.408	0.465	2.496	0.972	0.252	1.526	0.935	0.246	1.357	1.354
0	24	AR115	0.399	0.478	1.715	0.813	0.170	1.041	0.782	0.164	1.045	-10.775
0	25	AR142	0.346	0.545	2.071	0.903	0.138	1.255	0.835	0.124	6.774	3.319
0	26	AR166	0.381	0.358	1.452	1.262	0.229	0.745	1.208	0.196	-1.275	-4.410
0	27	AR268	0.239	0.200	1.828	2.140	0.192	1.042	2.178	0.188	-3.663	2.266
0	28	AR104	0.567	0.637	2.126	0.028	0.168	1.357	-0.017	0.143	-3.041	-2.977
0	29	AR251	0.278	0.191	3.213	1.876	0.250	1.805	1.907	0.240	-7.948	0.878
0	30	AR079	0.208	0.285	2.423	1.839	0.156	1.443	1.836	0.149	-3.341	0.535
N	31	AR043	0.414	0.516	2.229	0.796	0.223	1.404	0.768	0.206	8.820	4.101
N	32	AR013	0.584	0.489	1.247	0.025	0.212	0.707	-0.125	0.134	-3.032	-2.274
0	33	AR118	0.352	0.375	1.609	1.329	0.226	0.975	1.285	0.206	5.534	3.456
N	34	AR003	0.756	0.554	1.383	-0.927	0.217	0.804	-0.984	0.134	-1.701	-7.840
0	35	AR119	0.220	0.374	1.907	1.678	0.137	1.096	1.636	0.118	6.546	5.632
0	36	AR205	0.195	0.482	2.199	1.500	0.102	1.323	1.483	0.086	-1.437	-0.230
0	37	AR057	0.323	0.539	2.253	0.993	0.164	1.471	0.959	0.141	10.487	-0.108
N	38	AR020	0.741	0.512	1.221	-0.978	0.232	0.608	-1.090	0.134	0.238	-4.777
0	39	AR083	0.514	0.554	1.504	0.111	0.149	1.069	0.239	0.160	-0.574	-1.889
0	40	AR253	0.334	0.600	1.787	0.666	0.070	1.114	0.684	0.049	19.078	1.856
0	41	AR198	0.327	0.565	1.885	0.822	0.120	1.197	0.857	0.100	1.253	-1.676
0	42	AR061	0.232	0.281	2.565	1.762	0.197	1.549	1.751	0.171	-3.804	7.861
N	43	AR041	0.318	0.483	1.967	1.004	0.174	1.350	1.067	0.153	1.229	0.623
0	44	AR075	0.341	0.477	2.402	0.979	0.220	1.794	1.063	0.201	-2.599	7.835
0	45	AR232	0.240	0.474	1.564	1.264	0.101	1.047	1.344	0.089	1.300	3.485
0	46	AR218	0.348	0.480	1.733	0.835	0.175	1.199	1.007	0.166	-6.686	-1.157
N	47	AR044	0.270	0.229	2.278	1.795	0.263	1.532	1.846	0.220	-2.234	5.160
0	48	AR082	0.215	0.216	2.906	1.875	0.214	1.964	1.901	0.176	0.074	-0.919
0	49	AR262	0.462	0.451	1.355	0.146	0.173	0.758	0.600	0.172	-2.105	0.608
0	50	AR089	0.178	0.349	2.101	1.695	0.135	1.299	1.841	0.110	4.689	4.635

CAST Arithmetic Reasoning Item Statistics Separate Form 5

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	AR109	0.370	0.486	1.560	0.895	0.138	0.819	0.801	0.101	-24.811	-1.512
O	2	AR141	0.501	0.581	2.137	0.410	0.209	1.353	0.392	0.214	3.735	1.918
O	3	AR187	0.344	0.446	1.898	1.196	0.192	1.011	1.127	0.170	-4.428	6.413
O	4	AR081	0.241	0.565	2.021	1.163	0.067	1.158	1.160	0.064	11.518	7.739
O	5	AR178	0.493	0.532	1.884	0.521	0.224	1.135	0.479	0.218	0.535	4.461
N	6	AR014	0.320	0.415	1.792	1.228	0.164	0.959	1.271	0.161	-0.337	-1.527
O	7	AR133	0.364	0.428	1.568	1.122	0.185	0.914	1.065	0.171	6.001	14.944
O	8	AR210	0.850	0.400	0.980	-1.863	0.150	0.519	-2.176	0.138	-1.139	-3.283
O	9	AR159	0.432	0.564	1.930	0.621	0.168	1.170	0.557	0.155	6.006	1.673
N	10	AR038	0.341	0.464	2.371	1.141	0.196	1.413	1.126	0.197	-0.829	-0.616
O	11	AR066	0.804	0.604	1.593	-1.033	0.195	1.054	-1.090	0.138	-0.077	-7.136
O	12	AR228	0.522	0.601	2.081	0.281	0.189	1.080	0.101	0.115	4.809	0.421
O	13	AR263	0.356	0.506	2.220	0.969	0.171	1.195	0.934	0.160	6.294	-2.302
O	14	AR268	0.245	0.285	1.314	1.937	0.142	0.634	2.103	0.130	-6.959	2.777
O	15	AR273	0.610	0.488	1.224	-0.041	0.212	0.683	-0.247	0.138	0.656	3.010
N	16	AR031	0.786	0.450	1.068	-1.308	0.124	0.624	-1.364	0.138	-1.229	-5.176
O	17	AR221	0.512	0.457	1.708	0.617	0.271	0.956	0.560	0.258	-3.867	-3.233
O	18	AR250	0.370	0.482	2.387	1.007	0.208	1.293	0.985	0.198	-9.341	-4.237
N	19	AR005	0.895	0.446	1.101	-2.140	0.164	0.566	-2.576	0.138	-1.721	-0.707
O	20	AR248	0.442	0.373	1.013	0.835	0.166	0.552	0.743	0.138	-2.857	-2.457
O	21	AR230	0.367	0.436	2.165	1.125	0.223	1.154	1.094	0.206	1.238	1.348
O	22	AR051	0.137	0.457	1.928	1.872	0.060	1.079	1.911	0.054	1.394	0.973
O	23	AR215	0.614	0.566	1.495	-0.219	0.138	0.911	-0.259	0.124	-3.980	-1.776
N	24	AR048	0.564	0.560	2.042	0.279	0.261	1.164	0.162	0.221	-4.729	-2.994
O	25	AR227	0.481	0.669	2.226	0.201	0.092	1.340	0.141	0.068	0.563	2.439
O	26	AR131	0.323	0.478	1.886	1.113	0.151	0.933	1.054	0.117	-5.941	1.443
O	27	AR056	0.164	0.405	1.346	1.952	0.058	0.724	2.008	0.047	-5.179	4.501
O	28	AR088	0.495	0.609	1.997	0.340	0.175	1.281	0.260	0.148	17.427	4.598
O	29	AR053	0.464	0.559	1.932	0.502	0.189	1.121	0.435	0.157	5.124	4.275
O	30	AR100	0.310	0.523	1.929	1.039	0.131	1.182	1.024	0.121	0.262	1.449
O	31	AR261	0.477	0.560	1.622	0.340	0.140	0.991	0.318	0.126	0.622	0.152
O	32	AR275	0.337	0.614	1.886	0.740	0.082	1.182	0.694	0.064	0.455	-0.178
O	33	AR135	0.279	0.331	2.330	1.604	0.208	1.372	1.613	0.197	1.701	4.901
O	34	AR246	0.417	0.431	1.653	0.951	0.241	0.870	0.902	0.199	-2.537	-6.931
O	35	AR252	0.631	0.609	1.537	-0.432	0.129	1.023	-0.356	0.101	-0.336	-2.185
O	36	AR093	0.286	0.186	2.056	2.115	0.266	1.334	2.155	0.248	3.072	2.308
N	37	AR001	0.816	0.512	1.216	-1.637	0.185	0.726	-1.397	0.138	-0.419	-1.343
N	38	AR009	0.347	0.593	2.264	0.760	0.144	1.385	0.775	0.119	6.846	3.541
O	39	AR158	0.608	0.553	1.350	-0.416	0.142	0.886	-0.210	0.138	0.125	-2.293
O	40	AR072	0.214	0.374	1.831	1.737	0.143	1.057	1.757	0.120	4.149	10.440
O	41	AR234	0.451	0.573	1.680	0.323	0.150	1.098	0.428	0.133	7.334	-0.948
O	42	AR078	0.224	0.245	2.576	2.003	0.209	1.346	2.112	0.180	7.785	9.715
O	43	AR171	0.136	0.411	2.853	1.827	0.101	1.864	1.872	0.082	-3.421	0.633
N	44	AR013	0.495	0.425	1.013	0.169	0.179	0.630	0.370	0.138	2.499	-2.362
O	45	AR235	0.476	0.610	2.464	0.284	0.230	1.537	0.424	0.193	2.194	2.552
O	46	AR157	0.440	0.500	1.858	0.630	0.273	1.332	0.804	0.249	1.883	3.253
N	47	AR039	0.386	0.508	3.297	0.833	0.282	2.000	0.915	0.230	2.290	-1.206
O	48	AR259	0.290	0.402	2.392	1.304	0.223	1.403	1.399	0.182	1.304	0.283
N	49	AR041	0.319	0.569	3.386	0.868	0.198	2.000	0.966	0.158	3.581	2.310
O	50	AR060	0.175	0.279	2.922	1.875	0.158	1.780	1.956	0.130	-0.434	-0.613

CAST Arithmetic Reasoning Item Statistics Separate Form 6

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
0	1	AR155	0.278	0.266	2.612	1.793	0.226	1.554	1.757	0.219	0.861	3.670
0	2	AR209	0.791	0.513	1.111	-1.212	0.177	0.661	-1.383	0.094	1.502	0.942
0	3	AR190	0.344	0.426	1.558	1.206	0.171	0.881	1.118	0.153	11.255	1.911
N	4	AR041	0.513	0.503	1.324	0.328	0.165	0.862	0.292	0.167	7.852	5.840
0	5	AR117	0.336	0.310	1.333	1.613	0.208	0.742	1.598	0.201	4.270	-1.813
0	6	AR246	0.520	0.425	1.373	0.590	0.257	0.793	0.511	0.242	0.279	-4.331
0	7	AR106	0.291	0.330	1.800	1.707	0.201	0.963	1.640	0.185	3.124	6.183
N	8	AR050	0.413	0.518	1.498	0.614	0.115	0.923	0.545	0.102	5.195	3.714
0	9	AR121	0.312	0.639	1.939	0.776	0.048	1.152	0.686	0.027	10.659	12.279
0	10	AR271	0.787	0.613	1.786	-0.928	0.168	1.152	-0.981	0.094	0.719	3.526
N	11	AR013	0.708	0.452	1.005	-0.708	0.186	0.571	-0.963	0.094	0.039	-1.574
0	12	AR264	0.304	0.447	1.967	1.268	0.158	1.134	1.205	0.151	-0.199	5.071
0	13	AR212	0.763	0.528	1.275	-1.006	0.142	0.813	-1.052	0.094	-0.795	-0.897
0	14	AR140	0.416	0.580	2.015	0.605	0.149	1.279	0.530	0.133	6.812	2.647
N	15	AR034	0.523	0.549	1.543	0.245	0.162	1.085	0.215	0.168	4.373	8.024
N	16	AR012	0.627	0.501	1.127	-0.410	0.103	0.749	-0.410	0.094	-0.302	-1.560
0	17	AR237	0.590	0.602	1.633	-0.175	0.107	1.046	-0.249	0.063	0.048	-5.287
N	18	AR040	0.261	0.446	1.379	1.430	0.093	0.828	1.336	0.083	-0.749	-6.150
0	19	AR054	0.485	0.466	1.493	0.654	0.230	0.906	0.564	0.216	6.048	0.491
0	20	AR217	0.648	0.562	1.548	-0.257	0.197	0.909	-0.448	0.094	0.488	1.753
0	21	AR216	0.491	0.563	1.684	0.303	0.140	1.010	0.202	0.102	-1.950	3.020
0	22	AR076	0.192	0.458	2.321	1.607	0.105	1.190	1.588	0.088	3.487	1.333
0	23	AR254	0.735	0.500	1.137	-0.965	0.120	0.740	-0.957	0.094	-2.636	-3.810
0	24	AR108	0.352	0.553	2.195	0.916	0.156	1.396	0.820	0.144	-0.337	-1.631
0	25	AR188	0.275	0.523	1.539	1.147	0.072	0.906	1.048	0.052	8.605	4.253
0	26	AR174	0.373	0.249	2.323	1.767	0.318	1.231	1.711	0.306	-8.723	0.801
0	27	AR092	0.369	0.599	1.880	0.728	0.119	1.220	0.640	0.098	-1.893	-1.736
N	28	AR045	0.357	0.506	1.782	0.938	0.156	1.077	0.856	0.134	-1.233	0.100
0	29	AR097	0.322	0.417	1.573	1.324	0.180	0.957	1.236	0.160	1.064	3.182
0	30	AR245	0.308	0.536	1.671	1.037	0.112	1.091	0.945	0.094	2.720	1.348
0	31	AR201	0.390	0.585	1.738	0.638	0.125	1.166	0.585	0.105	12.848	5.134
0	32	AR207	0.166	0.465	2.070	1.762	0.084	1.147	1.695	0.069	1.253	11.112
0	33	AR238	0.580	0.648	1.942	-0.100	0.160	1.314	-0.105	0.120	0.027	-0.582
0	34	AR130	0.288	0.439	2.449	1.369	0.191	1.464	1.284	0.170	0.244	2.126
N	35	AR002	0.754	0.540	1.257	-1.161	0.134	0.773	-1.038	0.094	-0.697	-1.938
0	36	AR143	0.331	0.571	2.051	0.886	0.137	1.368	0.841	0.120	-10.188	-1.029
N	37	AR037	0.456	0.415	1.827	0.962	0.319	0.988	0.878	0.264	-2.222	-5.853
0	38	AR206	0.194	0.386	2.087	1.784	0.131	1.356	1.725	0.117	1.057	-0.273
0	39	AR256	0.401	0.564	2.168	0.665	0.199	1.519	0.704	0.184	3.306	-0.248
0	40	AR268	0.202	0.262	1.168	2.425	0.144	0.671	2.440	0.122	-0.453	7.007
0	41	AR177	0.201	0.172	2.498	2.332	0.195	1.824	2.287	0.175	-2.223	1.617
0	42	AR113	0.235	0.305	1.797	1.918	0.192	1.222	1.916	0.173	-2.362	-1.762
N	43	AR007	0.596	0.404	0.921	-0.551	0.161	0.484	-0.350	0.094	-2.761	-4.774
0	44	AR162	0.405	0.482	1.712	0.744	0.231	1.129	0.870	0.206	-0.253	-1.181
0	45	AR272	0.389	0.497	1.939	0.747	0.225	1.226	0.902	0.201	0.194	-2.846
0	46	AR150	0.270	0.311	1.630	1.750	0.222	1.135	1.791	0.194	-1.350	4.312
0	47	AR169	0.197	0.489	1.872	1.468	0.105	1.205	1.530	0.086	-2.231	-1.881
0	48	AR069	0.352	0.457	1.767	0.899	0.217	1.123	1.089	0.187	0.287	0.162
0	49	AR066	0.435	0.509	1.735	0.356	0.205	0.950	0.654	0.172	-5.660	-2.261
0	50	AR062	0.176	0.158	1.904	2.618	0.185	1.531	2.577	0.157	2.477	0.968

CAST Arithmetic Reasoning Item Statistics Separate Form 7

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	AR223	0.449	0.533	1.530	0.508	0.144	0.916	0.466	0.140	-2.893	-0.910
O	2	AR203	0.267	0.304	1.158	1.826	0.135	0.635	1.934	0.138	3.998	1.264
O	3	AR170	0.150	0.298	2.349	2.129	0.114	1.283	2.274	0.106	0.871	-3.435
O	4	AR267	0.252	0.276	2.245	1.844	0.189	1.112	1.961	0.185	5.120	2.942
O	5	AR134	0.205	0.424	1.777	1.711	0.105	0.997	1.749	0.102	0.998	13.281
N	6	AR023	0.657	0.502	1.211	-0.489	0.134	0.701	-0.650	0.076	0.208	-3.079
O	7	AR202	0.311	0.489	1.344	1.093	0.086	0.749	1.059	0.076	0.114	-4.068
O	8	AR244	0.404	0.542	1.696	0.725	0.150	0.909	0.593	0.110	5.219	5.476
O	9	AR064	0.278	0.363	1.633	1.600	0.164	0.879	1.632	0.157	3.780	1.082
O	10	AR246	0.481	0.458	1.607	0.676	0.242	0.849	0.547	0.206	-3.370	-1.504
O	11	AR199	0.529	0.519	1.731	0.389	0.239	0.953	0.262	0.204	-1.996	-1.338
O	12	AR098	0.354	0.562	2.539	0.907	0.166	1.357	0.860	0.156	5.655	4.502
O	13	AR268	0.241	0.253	1.178	2.247	0.154	0.665	2.329	0.154	-5.122	3.390
N	14	AR013	0.670	0.373	0.827	-0.616	0.163	0.519	-0.708	0.143	-2.636	-2.339
O	15	AR066	0.764	0.591	1.614	-0.895	0.142	0.862	-1.191	0.000	0.172	-2.301
O	16	AR175	0.537	0.626	1.858	0.013	0.104	1.041	-0.077	0.075	-6.209	-6.889
O	17	AR243	0.406	0.582	2.560	0.722	0.187	1.337	0.642	0.166	3.935	0.698
O	18	AR197	0.574	0.594	1.670	0.072	0.195	1.037	-0.052	0.161	3.486	0.608
O	19	AR151	0.407	0.384	1.521	1.102	0.235	0.771	1.031	0.204	0.985	-0.561
O	20	AR160	0.404	0.520	1.749	0.758	0.165	0.979	0.696	0.150	4.178	-0.448
O	21	AR052	0.595	0.618	1.936	-0.079	0.179	1.123	-0.148	0.157	5.481	0.476
O	22	AR090	0.182	0.319	2.896	1.882	0.130	1.410	1.986	0.125	-1.221	-2.176
O	23	AR229	0.352	0.396	1.897	1.290	0.221	1.071	1.258	0.211	2.452	-2.355
O	24	AR124	0.148	-0.063	0.221	9.964	0.062	1.030	18.650	0.139	1.145	7.270
O	25	AR184	0.186	0.322	2.603	1.879	0.133	1.543	1.917	0.127	1.614	5.617
O	26	AR122	0.488	0.546	1.859	0.452	0.208	0.982	0.318	0.158	-1.156	-3.073
O	27	AR086	0.404	0.575	1.798	0.605	0.131	1.045	0.550	0.113	18.421	8.676
N	28	AR035	0.551	0.571	1.945	0.255	0.250	1.048	0.086	0.181	-0.809	-1.732
O	29	AR194	0.738	0.587	1.468	-0.825	0.159	0.887	-0.970	0.056	-0.060	-0.762
O	30	AR257	0.432	0.493	1.832	0.806	0.229	0.999	0.695	0.191	0.790	0.662
N	31	AR018	0.406	0.634	1.917	0.458	0.096	1.038	0.367	0.047	0.429	-0.785
O	32	AR260	0.235	0.379	1.349	1.747	0.120	0.749	1.772	0.105	-0.400	-2.385
O	33	AR154	0.360	0.336	1.272	1.480	0.226	0.616	1.318	0.161	1.061	-1.319
N	34	AR026	0.290	0.392	1.895	1.507	0.189	0.958	1.472	0.160	4.411	2.612
O	35	AR077	0.299	0.285	2.407	1.721	0.243	1.252	1.748	0.225	1.991	-1.234
O	36	AR071	0.256	0.455	1.766	1.387	0.129	0.907	1.399	0.101	-2.800	2.416
O	37	AR213	0.490	0.574	1.467	0.186	0.138	0.933	0.186	0.105	3.440	1.323
O	38	AR172	0.188	0.352	1.908	1.962	0.132	0.936	2.059	0.110	9.278	6.288
O	39	AR226	0.347	0.568	1.684	0.765	0.111	1.051	0.776	0.099	-0.283	0.639
N	40	AR041	0.362	0.575	1.924	0.790	0.158	1.133	0.740	0.118	4.939	-0.798
O	41	AR107	0.157	0.233	2.235	2.284	0.142	1.266	2.408	0.122	-4.962	1.693
O	42	AR208	0.567	0.584	1.547	-0.289	0.118	0.956	-0.169	0.089	-0.379	-4.963
O	43	AR224	0.325	0.392	2.549	1.374	0.259	1.466	1.373	0.221	3.322	2.190
N	44	AR028	0.626	0.628	2.014	-0.516	0.136	1.109	-0.381	0.092	-3.899	0.931
N	45	AR033	0.228	0.319	1.986	1.861	0.185	1.085	1.902	0.152	-7.146	-2.202
N	46	AR010	0.548	0.566	1.745	-0.142	0.201	1.042	0.058	0.163	-1.509	-3.682
O	47	AR173	0.610	0.576	1.712	-0.614	0.110	0.915	-0.369	0.075	1.311	-0.035
O	48	AR101	0.207	0.439	2.823	1.548	0.151	1.467	1.642	0.121	1.384	2.353
N	49	AR021	0.650	0.442	1.247	-0.901	0.159	0.660	-0.463	0.155	-3.195	-2.245
O	50	AR193	0.212	0.292	2.832	1.847	0.190	1.597	1.963	0.160	-0.458	-0.921

CAST Arithmetic Reasoning Item Statistics Separate Form 8

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
0	1	AR246	0.518	0.407	1.803	0.813	0.340	0.948	0.797	0.325	-0.002	0.180
0	2	AR103	0.626	0.425	1.024	-0.206	0.186	0.581	-0.325	0.150	4.501	5.169
0	3	AR182	0.380	0.546	1.704	0.714	0.117	0.885	0.643	0.078	3.263	16.296
0	4	AR095	0.229	0.385	1.616	1.643	0.117	0.779	1.790	0.103	2.430	9.364
N	5	AR047	0.637	0.580	1.729	-0.209	0.190	1.047	-0.274	0.163	6.619	5.071
N	6	AR004	0.946	0.383	1.010	-3.016	0.181	0.449	-4.296	0.150	-0.293	-0.428
0	7	AR161	0.790	0.480	1.120	-1.222	0.164	0.673	-1.285	0.150	-1.297	-1.366
N	8	AR013	0.743	0.402	0.941	-0.997	0.178	0.493	-1.222	0.150	-0.589	-2.063
0	9	AR196	0.600	0.545	2.047	0.166	0.285	1.061	0.022	0.230	-1.560	2.152
N	10	AR041	0.479	0.500	1.623	0.436	0.167	0.863	0.376	0.141	1.899	-2.711
0	11	AR165	0.416	0.432	1.383	0.786	0.162	0.732	0.798	0.150	-3.918	-12.867
0	12	AR085	0.553	0.541	1.718	0.150	0.188	0.925	0.053	0.149	-0.593	-0.696
0	13	AR242	0.589	0.518	2.210	0.258	0.303	1.120	0.172	0.270	-0.158	0.696
0	14	AR070	0.295	0.391	2.114	1.398	0.188	1.155	1.469	0.181	5.783	4.472
0	15	AR220	0.527	0.616	1.966	0.031	0.089	1.127	-0.006	0.075	-2.649	-11.278
0	16	AR137	0.775	0.641	2.270	-0.636	0.277	1.337	-0.816	0.166	2.212	-1.546
0	17	AR099	0.231	0.546	2.394	1.215	0.088	1.146	1.287	0.074	1.802	1.110
0	18	AR192	0.352	0.451	2.041	1.101	0.197	1.061	1.114	0.181	1.972	0.786
0	19	AR149	0.225	0.512	2.035	1.334	0.089	1.017	1.390	0.072	4.435	0.619
0	20	AR112	0.449	0.547	2.010	0.577	0.189	1.136	0.530	0.171	7.079	4.283
0	21	AR200	0.372	0.564	2.387	0.789	0.162	1.309	0.771	0.148	4.603	8.601
N	22	AR049	0.395	0.533	1.588	0.691	0.123	0.734	0.498	0.030	9.872	8.368
0	23	AR128	0.409	0.568	2.598	0.673	0.184	1.470	0.662	0.177	4.345	1.712
0	24	AR247	0.323	0.537	2.448	0.997	0.153	1.309	1.010	0.143	1.820	5.521
0	25	AR144	0.356	0.513	2.188	0.858	0.154	1.238	0.904	0.156	7.797	5.417
0	26	AR168	0.340	0.336	2.180	1.476	0.254	1.257	1.588	0.253	2.277	4.931
N	27	AR027	0.271	0.305	1.513	1.785	0.181	0.813	1.919	0.170	-1.343	1.429
0	28	AR185	0.279	0.336	1.220	1.587	0.136	0.543	1.751	0.098	-6.835	-0.615
N	29	AR046	0.202	0.409	3.058	1.606	0.136	1.487	1.739	0.125	3.562	0.856
N	30	AR029	0.557	0.571	1.741	0.100	0.198	1.077	0.085	0.176	-1.541	-0.444
0	31	AR189	0.317	0.289	1.284	1.928	0.231	0.583	1.976	0.185	5.609	7.031
0	32	AR186	0.272	0.500	3.474	1.181	0.165	1.886	1.229	0.150	-1.507	5.770
0	33	AR066	0.589	0.593	1.706	-0.146	0.169	1.137	-0.081	0.160	0.616	-8.988
0	34	AR236	0.499	0.455	1.197	0.268	0.159	0.701	0.330	0.142	-1.800	-15.963
0	35	AR080	0.273	0.266	2.491	1.879	0.240	1.248	2.048	0.219	-2.380	-2.141
0	36	AR195	0.620	0.550	1.383	-0.408	0.169	0.925	-0.169	0.185	0.679	-2.352
0	37	AR204	0.212	0.301	2.562	1.898	0.181	1.438	2.037	0.160	-0.094	-4.496
N	38	AR017	0.737	0.533	1.290	-1.158	0.163	0.753	-0.868	0.150	0.145	-3.409
N	39	AR030	0.737	0.495	1.196	-1.288	0.137	0.668	-0.951	0.150	-2.258	-4.263
0	40	AR084	0.174	0.261	3.217	2.032	0.158	2.000	2.215	0.140	-3.154	1.469
0	41	AR139	0.474	0.475	1.160	0.279	0.168	0.741	0.485	0.154	0.620	-2.645
0	42	AR211	0.636	0.503	1.147	-0.744	0.138	0.699	-0.360	0.150	1.735	0.170
0	43	AR180	0.386	0.449	1.063	0.606	0.111	0.645	0.779	0.084	10.669	2.887
0	44	AR268	0.199	0.224	1.803	2.298	0.182	0.876	2.600	0.152	-6.354	0.382
0	45	AR231	0.251	0.446	2.040	1.346	0.164	1.137	1.513	0.134	2.397	6.781
0	46	AR116	0.223	0.393	1.937	1.583	0.162	1.129	1.781	0.135	-1.575	8.570
0	47	AR091	0.300	0.451	2.043	1.133	0.200	1.174	1.339	0.168	-1.321	6.204
0	48	AR214	0.336	0.408	1.279	1.027	0.184	0.762	1.313	0.157	-0.658	-0.048
0	49	AR129	0.302	0.408	1.886	1.221	0.217	1.096	1.477	0.185	6.301	12.515
0	50	AR265	0.257	0.178	2.014	2.285	0.268	1.557	2.504	0.233	-1.492	-2.557

CAST Arithmetic Reasoning Item Statistics Separate Form '9

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	AR019	0.714	0.407	0.918	-0.769	0.204	0.475	-1.119	0.117	5.935	0.242
O	2	AR146	0.517	0.321	1.065	0.735	0.271	0.429	0.269	0.117	-7.748	-1.597
O	3	AR136	0.195	0.386	1.497	1.734	0.085	0.690	1.857	0.056	12.215	2.267
N	4	AR032	0.329	0.529	2.015	0.890	0.129	1.093	0.909	0.109	-1.891	1.063
N	5	AR013	0.710	0.370	0.855	-0.750	0.213	0.447	-1.137	0.117	-2.317	-2.797
O	6	AR067	0.730	0.519	1.274	-0.877	0.117	0.789	-0.883	0.117	-1.783	-0.126
O	7	AR191	0.320	0.422	1.926	1.208	0.177	1.080	1.243	0.170	1.845	-0.732
O	8	AR246	0.475	0.361	1.473	0.930	0.287	0.932	1.013	0.308	-6.176	-0.314
O	9	AR055	0.429	0.452	1.353	0.605	0.136	0.711	0.588	0.110	3.256	4.100
O	10	AR145	0.574	0.574	1.677	-0.042	0.149	0.987	-0.104	0.117	-1.743	-4.506
N	11	AR024	0.643	0.470	1.141	-0.381	0.156	0.678	-0.479	0.117	0.235	-3.129
O	12	AR126	0.606	0.566	1.601	-0.210	0.134	0.925	-0.282	0.095	1.786	-0.597
O	13	AR163	0.317	0.335	1.508	1.456	0.190	0.820	1.549	0.184	0.451	8.810
O	14	AR225	0.378	0.407	1.147	0.915	0.122	0.581	0.854	0.078	5.413	0.512
O	15	AR073	0.411	0.470	1.584	0.735	0.166	0.862	0.731	0.147	1.003	-2.916
O	16	AR274	0.484	0.513	2.211	0.610	0.265	1.175	0.559	0.234	2.938	0.365
O	17	AR269	0.722	0.461	1.112	-0.843	0.155	0.630	-0.965	0.117	-5.291	-1.850
N	18	AR011	0.819	0.450	1.093	-1.483	0.156	0.594	-1.707	0.117	-3.063	-2.112
O	19	AR164	0.373	0.322	1.376	1.353	0.228	0.692	1.379	0.204	-3.315	-2.209
O	20	AR222	0.560	0.554	1.722	0.096	0.189	0.995	0.049	0.163	-12.065	-1.606
O	21	AR268	0.217	0.229	1.224	2.355	0.147	0.602	2.602	0.135	0.014	2.560
O	22	AR249	0.304	0.358	1.408	1.416	0.157	0.788	1.497	0.155	2.500	3.711
O	23	AR147	0.434	0.526	1.945	0.651	0.196	0.919	0.522	0.125	-0.487	4.742
O	24	AR102	0.658	0.636	1.744	-0.468	0.109	1.084	-0.521	0.057	4.464	11.714
O	25	AR266	0.327	0.399	1.109	1.156	0.102	0.592	1.096	0.063	2.778	2.863
O	26	AR087	0.184	0.241	2.273	2.034	0.145	1.177	2.225	0.138	3.457	4.685
O	27	AR123	0.177	0.392	2.041	1.759	0.104	1.042	1.854	0.089	-5.242	2.753
O	28	AR111	0.222	0.455	1.526	1.461	0.083	0.869	1.477	0.065	7.264	15.400
N	29	AR036	0.544	0.575	1.602	0.053	0.152	0.983	0.022	0.119	0.524	-0.965
O	30	AR110	0.396	0.520	2.308	0.823	0.213	1.277	0.812	0.188	8.879	4.695
O	31	AR148	0.270	0.309	1.696	1.714	0.195	0.992	1.786	0.181	-0.480	3.322
O	32	AR239	0.488	0.510	1.307	0.277	0.136	0.793	0.244	0.101	1.980	1.307
O	33	AR138	0.285	0.432	2.144	1.269	0.169	1.291	1.308	0.156	0.889	-1.234
O	34	AR219	0.462	0.566	2.142	0.487	0.212	1.184	0.434	0.159	5.915	4.408
O	35	AR066	0.607	0.559	1.651	-0.114	0.231	1.038	-0.103	0.184	2.552	-0.252
O	36	AR127	0.273	0.174	1.978	2.114	0.249	1.167	2.210	0.231	-2.213	1.545
O	37	AR179	0.367	0.601	2.262	0.614	0.133	1.347	0.645	0.103	3.880	3.746
N	38	AR016	0.460	0.599	1.797	0.219	0.127	1.136	0.306	0.102	5.839	0.668
O	39	AR125	0.515	0.580	2.046	0.179	0.229	1.429	0.329	0.216	4.635	-0.848
O	40	AR096	0.196	0.258	3.463	1.795	0.176	2.000	1.919	0.153	-0.877	1.176
O	41	AR183	0.307	0.528	2.062	0.959	0.157	1.338	1.036	0.133	2.294	9.643
N	42	AR042	0.383	0.474	1.568	0.727	0.195	0.995	0.925	0.174	0.545	-17.382
O	43	AR074	0.249	0.316	2.110	1.674	0.210	1.591	1.783	0.190	-3.351	1.719
N	44	AR015	0.268	0.282	2.374	1.626	0.241	1.582	1.748	0.206	-1.507	-4.360
O	45	AR059	0.326	0.485	1.687	0.821	0.158	1.027	1.082	0.139	4.507	1.035
O	46	AR181	0.369	0.433	1.613	0.765	0.213	0.928	1.093	0.185	-10.118	-12.975
O	47	AR132	0.259	0.370	1.351	1.364	0.155	0.849	1.669	0.135	5.373	2.452
O	48	AR120	0.233	0.348	2.203	1.513	0.192	1.433	1.724	0.161	2.179	-2.407
O	49	AR270	0.498	0.329	0.924	-0.076	0.194	0.415	0.406	0.117	4.026	-4.339
N	50	AR041	0.295	0.453	1.885	0.934	0.171	1.091	1.276	0.147	3.905	6.140

CAST Arithmetic Reasoning Item Statistics Separate Form 10

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	AR089	0.305	0.453	1.629	1.184	0.132	0.872	1.143	0.106	5.588	14.005
O	2	AR262	0.792	0.493	1.100	-1.223	0.185	0.621	-1.418	0.129	-0.383	1.898
O	3	AR082	0.250	0.335	2.700	1.593	0.172	1.613	1.636	0.181	2.858	-2.091
N	4	AR044	0.348	0.298	1.124	1.620	0.209	0.597	1.590	0.181	3.438	1.366
O	5	AR218	0.450	0.442	1.125	0.518	0.110	0.628	0.444	0.086	0.012	0.366
O	6	AR232	0.349	0.430	1.215	1.038	0.109	0.737	0.998	0.107	2.188	4.501
O	7	AR075	0.447	0.544	1.765	0.565	0.166	1.070	0.486	0.142	-0.538	3.717
N	8	AR041	0.472	0.536	1.541	0.393	0.135	0.942	0.339	0.118	7.868	4.752
O	9	AR061	0.315	0.332	1.596	1.499	0.190	0.919	1.519	0.193	-4.919	2.110
O	10	AR198	0.481	0.619	1.830	0.203	0.088	1.126	0.157	0.062	3.612	0.005
O	11	AR253	0.492	0.611	1.709	0.158	0.081	1.063	0.116	0.058	3.452	3.101
O	12	AR083	0.580	0.464	1.103	-0.170	0.105	0.702	-0.109	0.129	0.510	-0.186
N	13	AR020	0.889	0.507	1.369	-1.802	0.175	0.697	-2.197	0.129	-2.630	-2.495
O	14	AR057	0.431	0.542	1.888	0.650	0.173	1.146	0.586	0.159	11.283	5.500
O	15	AR205	0.208	0.402	2.017	1.643	0.115	1.069	1.658	0.106	-0.582	0.440
O	16	AR119	0.318	0.411	1.525	1.323	0.161	0.881	1.253	0.146	2.493	0.491
N	17	AR003	0.884	0.551	1.509	-1.665	0.177	0.842	-1.910	0.129	-1.807	-2.408
O	18	AR118	0.387	0.386	1.653	1.134	0.222	0.871	1.099	0.203	9.423	-0.529
N	19	AR013	0.656	0.467	1.118	-0.374	0.185	0.644	-0.536	0.129	-1.022	-1.438
N	20	AR043	0.458	0.495	1.472	0.559	0.165	0.938	0.532	0.163	2.482	0.748
O	21	AR079	0.249	0.326	1.525	1.747	0.142	0.801	1.775	0.133	-4.904	1.777
O	22	AR251	0.281	0.201	2.405	1.982	0.243	1.819	2.004	0.249	-1.082	4.305
O	23	AR104	0.609	0.626	2.097	-0.144	0.168	1.294	-0.177	0.130	1.342	-0.805
O	24	AR268	0.217	0.242	1.781	2.129	0.163	1.164	2.070	0.165	-3.793	3.091
O	25	AR166	0.373	0.346	1.783	1.332	0.250	0.903	1.287	0.224	-1.164	-0.453
O	26	AR142	0.336	0.537	1.896	0.920	0.123	1.151	0.841	0.105	0.635	6.907
O	27	AR115	0.376	0.512	1.783	0.852	0.157	1.053	0.784	0.133	-3.710	-8.663
O	28	AR258	0.378	0.455	2.134	1.041	0.225	1.327	0.959	0.205	-0.003	-0.599
O	29	AR240	0.481	0.558	1.746	0.362	0.162	1.115	0.347	0.146	3.949	1.236
O	30	AR255	0.512	0.528	2.069	0.501	0.270	1.446	0.476	0.259	1.887	2.055
O	31	AR114	0.276	0.382	2.970	1.499	0.207	1.659	1.457	0.190	-2.010	5.276
O	32	AR167	0.248	0.452	2.734	1.402	0.162	1.759	1.341	0.144	-1.202	3.571
N	33	AR025	0.648	0.597	1.633	-0.481	0.125	1.076	-0.391	0.105	-0.940	-8.219
O	34	AR241	0.456	0.468	1.317	0.545	0.176	0.712	0.399	0.091	-1.002	-3.571
O	35	AR156	0.444	0.590	2.582	0.538	0.217	1.849	0.539	0.194	6.545	2.294
O	36	AR105	0.514	0.617	1.681	-0.083	0.078	1.111	0.030	0.055	2.706	3.188
O	37	AR246	0.402	0.419	2.295	1.080	0.297	1.673	1.041	0.270	-0.160	1.469
O	38	AR063	0.241	0.344	1.968	1.684	0.184	1.259	1.642	0.156	-7.477	-3.816
O	39	AR152	0.194	0.190	3.268	1.996	0.183	1.968	2.028	0.161	4.353	10.299
O	40	AR066	0.545	0.549	1.722	-0.047	0.206	1.245	0.274	0.229	2.079	-12.709
N	41	AR006	0.630	0.554	1.684	-0.509	0.202	1.045	-0.061	0.242	-2.931	-0.914
O	42	AR094	0.334	0.434	1.917	1.144	0.226	1.477	1.163	0.202	-6.775	1.297
O	43	AR233	0.509	0.594	1.777	-0.157	0.105	1.167	0.191	0.130	-5.607	-6.002
O	44	AR068	0.254	0.500	3.056	1.190	0.171	2.000	1.204	0.135	-1.048	-0.970
O	45	AR058	0.446	0.409	1.291	0.558	0.254	1.157	0.934	0.275	3.248	-3.857
N	46	AR008	0.257	0.257	2.179	1.852	0.249	1.452	1.861	0.205	2.196	2.970
O	47	AR176	0.170	0.485	2.561	1.472	0.110	1.724	1.522	0.083	1.987	-2.780
O	48	AR065	0.231	0.199	1.895	2.134	0.237	1.347	2.128	0.193	-0.586	-4.190
O	49	AR153	0.187	0.164	3.833	2.014	0.205	2.000	2.144	0.162	-2.733	1.257
N	50	AR022	0.383	0.484	1.558	0.454	0.163	1.026	0.852	0.159	0.420	6.333

CAST Arithmetic Reasoning Item Statistics Separate Form 11

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	AR060	0.209	0.249	1.600	2.121	0.143	0.947	2.174	0.145	2.952	10.248
N	2	AR041	0.530	0.582	1.499	0.071	0.113	0.974	0.096	0.133	12.497	3.959
O	3	AR259	0.358	0.385	1.704	1.326	0.220	1.036	1.304	0.222	1.510	3.874
N	4	AR039	0.529	0.564	1.709	0.258	0.192	1.045	0.209	0.181	3.699	2.533
O	5	AR157	0.599	0.555	1.621	0.013	0.219	1.015	0.017	0.230	0.701	3.115
O	6	AR235	0.664	0.636	2.221	-0.150	0.280	1.502	-0.144	0.291	0.993	1.633
N	7	AR013	0.704	0.512	1.188	-0.622	0.191	0.687	-0.785	0.130	-0.354	-3.395
O	8	AR171	0.201	0.473	2.076	1.556	0.096	1.279	1.524	0.091	0.083	5.424
O	9	AR078	0.256	0.245	1.581	2.094	0.192	0.905	2.097	0.186	3.155	5.270
O	10	AR234	0.653	0.622	1.743	-0.372	0.150	1.129	-0.356	0.161	3.142	-1.138
O	11	AR072	0.250	0.352	1.550	1.696	0.139	0.800	1.736	0.127	1.534	5.732
O	12	AR158	0.774	0.579	1.378	-1.091	0.102	0.881	-1.059	0.130	0.327	-0.339
N	13	AR009	0.430	0.659	2.443	0.458	0.134	1.513	0.415	0.124	3.447	7.378
N	14	AR001	0.926	0.493	1.359	-2.205	0.157	0.562	-3.245	0.130	-0.105	-1.942
O	15	AR093	0.218	0.320	2.179	1.828	0.153	1.303	1.852	0.150	-1.142	-0.159
O	16	AR252	0.754	0.590	1.478	-0.927	0.120	0.965	-0.892	0.130	0.055	-3.549
O	17	AR246	0.494	0.499	1.559	0.514	0.214	0.850	0.392	0.174	2.984	0.518
O	18	AR135	0.319	0.423	1.706	1.283	0.167	0.961	1.263	0.159	4.254	2.554
O	19	AR275	0.370	0.562	1.547	0.648	0.067	0.890	0.586	0.048	0.688	6.437
O	20	AR261	0.454	0.577	1.594	0.407	0.119	0.987	0.358	0.109	-1.571	2.947
O	21	AR100	0.331	0.485	1.411	0.979	0.099	0.824	0.954	0.089	-1.079	-1.391
O	22	AR053	0.522	0.567	1.722	0.304	0.203	1.079	0.278	0.197	0.145	1.227
O	23	AR088	0.500	0.573	1.923	0.403	0.208	1.278	0.390	0.213	6.135	3.235
O	24	AR056	0.178	0.430	1.475	1.832	0.069	0.832	1.820	0.060	-5.999	-2.321
O	25	AR131	0.294	0.468	1.512	1.226	0.112	0.869	1.178	0.098	-3.413	-0.576
O	26	AR227	0.468	0.684	2.128	0.189	0.082	1.343	0.151	0.061	-1.218	-0.214
N	27	AR048	0.529	0.569	2.402	0.434	0.281	1.435	0.390	0.265	-3.347	-0.249
O	28	AR215	0.630	0.625	1.835	-0.237	0.183	1.264	-0.210	0.186	-0.347	-2.723
O	29	AR051	0.112	0.426	1.954	2.098	0.055	1.138	2.102	0.050	-2.063	4.141
O	30	AR230	0.366	0.432	1.818	1.149	0.214	1.038	1.105	0.197	0.027	0.979
O	31	AR248	0.420	0.376	1.036	1.004	0.186	0.591	0.875	0.149	0.151	-5.669
N	32	AR005	0.834	0.597	1.521	-1.442	0.131	0.958	-1.369	0.130	-1.065	-1.834
O	33	AR250	0.347	0.517	2.391	1.032	0.193	1.461	0.989	0.177	-6.890	-5.752
O	34	AR221	0.483	0.573	1.602	0.353	0.165	1.004	0.292	0.133	-3.115	-5.489
N	35	AR031	0.679	0.528	1.217	-0.660	0.161	0.748	-0.630	0.130	-4.800	-11.843
O	36	AR273	0.535	0.551	1.534	0.184	0.210	1.024	0.216	0.193	1.948	3.968
O	37	AR268	0.221	0.277	1.311	2.155	0.148	0.794	2.137	0.137	0.089	4.399
O	38	AR263	0.312	0.475	2.260	1.208	0.187	1.391	1.167	0.167	-0.776	-9.977
O	39	AR228	0.463	0.684	2.320	0.214	0.128	1.552	0.261	0.114	1.610	-4.362
O	40	AR066	0.575	0.588	1.915	0.033	0.263	1.313	0.201	0.268	1.306	-7.436
N	41	AR038	0.294	0.473	2.519	1.244	0.188	1.824	1.228	0.173	-4.435	-1.270
O	42	AR159	0.317	0.511	3.737	1.098	0.210	2.000	1.086	0.178	-0.961	2.656
O	43	AR210	0.674	0.514	1.285	-0.859	0.137	0.710	-0.613	0.130	-3.318	-5.582
O	44	AR133	0.270	0.466	1.829	1.296	0.153	1.323	1.326	0.142	6.318	2.492
N	45	AR014	0.223	0.452	1.934	1.498	0.135	1.427	1.517	0.122	17.597	-3.813
O	46	AR178	0.323	0.481	2.060	1.022	0.195	1.441	1.134	0.177	-0.045	0.319
O	47	AR081	0.171	0.515	2.158	1.545	0.088	1.464	1.566	0.072	6.541	-0.066
O	48	AR187	0.218	0.521	1.929	1.311	0.104	1.280	1.381	0.087	1.525	6.305
O	49	AR141	0.333	0.486	1.623	0.869	0.165	1.152	1.073	0.159	7.844	0.871
O	50	AR109	0.278	0.441	1.620	1.219	0.154	1.184	1.368	0.149	0.471	1.083

CAST Arithmetic Reasoning Item Statistics Separate Form 12

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
0	1	AR062	0.171	0.396	1.640	1.888	0.083	0.810	1.986	0.069	13.208	3.963
0	2	AR066	0.814	0.491	1.152	-1.311	0.188	0.584	-1.696	0.106	1.160	-1.640
0	3	AR069	0.540	0.508	1.575	0.387	0.240	0.986	0.339	0.239	4.520	8.417
0	4	AR169	0.339	0.457	1.212	0.939	0.068	0.637	0.866	0.039	0.889	-3.832
0	5	AR150	0.337	0.359	1.401	1.422	0.188	0.808	1.374	0.180	5.490	10.123
0	6	AR272	0.611	0.553	1.480	-0.097	0.183	0.964	-0.089	0.201	-1.418	-0.946
0	7	AR162	0.619	0.558	1.637	-0.123	0.184	0.997	-0.122	0.201	2.130	-3.273
N	8	AR007	0.838	0.380	0.816	-2.003	0.149	0.431	-2.423	0.106	-0.538	-1.544
0	9	AR113	0.278	0.370	1.761	1.541	0.163	0.854	1.560	0.144	2.725	5.121
0	10	AR177	0.179	0.347	2.210	1.856	0.111	1.213	1.912	0.111	2.695	1.885
0	11	AR268	0.194	0.256	1.209	2.341	0.112	0.610	2.523	0.107	-0.105	6.816
0	12	AR256	0.577	0.589	1.643	-0.068	0.132	1.015	-0.113	0.119	4.835	-0.080
0	13	AR206	0.224	0.496	1.798	1.420	0.083	1.068	1.385	0.079	-8.746	-0.276
N	14	AR037	0.507	0.397	0.934	0.242	0.104	0.536	0.218	0.106	-11.523	-1.431
0	15	AR143	0.439	0.576	1.652	0.426	0.095	0.911	0.331	0.063	-4.008	-4.291
N	16	AR002	0.901	0.574	1.570	-1.814	0.137	0.895	-2.018	0.106	-0.698	-1.285
0	17	AR130	0.371	0.437	1.590	1.061	0.182	0.914	0.997	0.166	9.800	3.070
0	18	AR238	0.652	0.628	2.293	-0.122	0.255	1.491	-0.160	0.246	0.741	3.868
0	19	AR207	0.161	0.496	2.161	1.685	0.067	1.148	1.672	0.058	6.836	-0.316
0	20	AR201	0.472	0.592	1.935	0.371	0.144	1.170	0.308	0.126	7.012	-2.496
0	21	AR245	0.347	0.581	1.685	0.759	0.079	0.975	0.679	0.055	0.573	10.049
0	22	AR097	0.361	0.480	1.742	1.020	0.173	1.044	0.941	0.155	4.267	5.331
N	23	AR045	0.391	0.486	1.598	0.847	0.159	0.900	0.792	0.141	3.748	2.372
0	24	AR092	0.409	0.517	2.040	0.788	0.194	1.201	0.726	0.179	1.982	2.563
0	25	AR174	0.397	0.234	1.406	1.796	0.310	0.741	1.836	0.300	-2.241	0.889
0	26	AR188	0.302	0.523	1.487	1.048	0.081	0.921	0.965	0.068	1.022	9.987
0	27	AR108	0.399	0.558	1.963	0.734	0.163	1.151	0.632	0.132	-9.225	-8.755
0	28	AR254	0.713	0.458	0.954	-0.993	0.115	0.608	-0.951	0.106	-1.627	-1.777
0	29	AR076	0.189	0.470	2.622	1.573	0.105	1.459	1.574	0.096	3.230	1.353
0	30	AR216	0.458	0.571	2.039	0.550	0.199	1.238	0.462	0.168	1.916	0.087
0	31	AR217	0.536	0.574	1.485	0.080	0.141	0.958	0.008	0.097	0.347	2.549
0	32	AR054	0.477	0.539	1.568	0.438	0.172	0.979	0.366	0.144	3.961	2.397
N	33	AR040	0.278	0.518	1.629	1.169	0.094	0.993	1.108	0.081	-0.153	-11.406
0	34	AR237	0.537	0.602	1.490	-0.051	0.093	0.987	-0.057	0.067	-0.221	-3.357
N	35	AR012	0.513	0.523	1.236	0.115	0.124	0.857	0.147	0.112	-1.634	-0.952
N	36	AR034	0.509	0.570	1.651	0.239	0.182	1.073	0.233	0.152	1.538	4.656
0	37	AR140	0.304	0.556	2.555	1.035	0.162	1.609	0.991	0.134	2.226	10.412
0	38	AR212	0.649	0.588	1.408	-0.621	0.115	0.900	-0.485	0.085	-0.011	-1.055
0	39	AR264	0.274	0.440	2.898	1.375	0.193	1.630	1.339	0.166	5.260	3.012
N	40	AR013	0.571	0.402	0.833	-0.255	0.157	0.513	-0.157	0.106	-4.310	-9.911
0	41	AR271	0.669	0.582	1.578	-0.704	0.153	0.927	-0.526	0.106	-1.094	0.813
0	42	AR121	0.254	0.666	2.418	0.945	0.076	1.659	0.945	0.062	11.309	17.743
N	43	AR050	0.281	0.540	1.653	1.014	0.098	1.040	1.032	0.072	3.770	-2.780
0	44	AR106	0.223	0.261	3.207	1.902	0.211	2.000	1.914	0.180	5.791	7.700
0	45	AR246	0.334	0.414	1.917	1.174	0.235	1.252	1.250	0.203	-4.096	-4.556
0	46	AR117	0.255	0.176	2.792	2.034	0.264	1.954	2.076	0.223	-2.517	-1.367
N	47	AR041	0.272	0.492	2.041	1.062	0.149	1.216	1.228	0.122	7.252	4.431
0	48	AR190	0.247	0.353	1.886	1.568	0.195	1.297	1.711	0.170	8.024	1.874
0	49	AR209	0.535	0.395	1.043	-0.487	0.102	0.523	0.057	0.106	-1.999	-3.544
0	50	AR155	0.175	0.296	3.192	1.879	0.166	2.000	1.979	0.134	8.508	-0.010

CAST Word Knowledge Item Statistics Separate Form 1

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	LOGIST a	LOGIST b	LOGIST c	Race chi-sq	Sex chi-sq
O	1	WK251	0.549	0.602	1.897	0.107	0.134	1.154	0.015	0.118	10.823	12.761
O	2	WK214	0.433	0.476	2.144	0.753	0.212	1.388	0.721	0.217	-1.490	-1.283
N	3	WK017	0.964	0.584	1.438	-2.840	0.169	0.801	-3.084	0.148	-0.395	-0.848
N	4	WK065	0.748	0.543	1.986	-0.386	0.317	1.309	-0.397	0.345	-1.426	8.390
N	5	WK059	0.980	0.560	1.368	-3.423	0.202	0.720	-3.921	0.148	-0.206	-0.292
O	6	WK262	0.917	0.579	1.589	-1.796	0.250	0.937	-2.001	0.148	-0.289	-0.201
N	7	WK006	0.631	0.363	1.014	0.020	0.259	0.483	-0.398	0.148	4.462	2.652
O	8	WK258	0.526	0.494	3.813	0.533	0.300	2.000	0.431	0.278	-3.996	6.216
O	9	WK212	0.764	0.413	0.934	-1.155	0.164	0.542	-1.261	0.148	4.551	23.761
N	10	WK062	0.777	0.384	0.859	-1.229	0.209	0.477	-1.497	0.148	-0.405	0.457
N	11	WK019	0.568	0.351	1.199	0.463	0.284	0.731	0.466	0.296	-1.280	-0.408
O	12	WK199	0.975	0.547	1.288	-3.358	0.201	0.693	-3.786	0.148	-0.051	-0.045
N	13	WK061	0.928	0.528	1.317	-2.263	0.186	0.763	-2.422	0.148	-0.242	-0.666
O	14	WK253	0.521	0.483	1.533	0.346	0.181	0.892	0.276	0.172	4.945	2.842
N	15	WK037	0.458	0.642	2.480	0.394	0.123	1.498	0.310	0.109	5.981	-0.393
O	16	WK241	0.849	0.591	1.864	-1.060	0.272	1.033	-1.323	0.148	2.378	-0.303
O	17	WK240	0.917	0.518	1.268	-2.205	0.158	0.727	-2.347	0.148	-0.558	-0.880
O	18	WK271	0.962	0.540	1.331	-2.897	0.188	0.735	-3.187	0.148	-0.864	-1.627
N	19	WK016	0.887	0.567	1.519	-1.567	0.228	0.877	-1.769	0.148	-0.269	0.662
N	20	WK102	0.361	0.317	1.465	1.334	0.211	0.777	1.392	0.203	-2.263	1.430
N	21	WK168	0.970	0.585	1.439	-3.031	0.168	0.867	-3.085	0.148	-0.311	-0.797
N	22	WK005	0.862	0.487	1.752	-0.878	0.447	1.224	-0.787	0.500	1.827	1.000
N	23	WK115	0.977	0.574	1.440	-3.266	0.194	0.797	-3.584	0.148	-0.207	-0.580
N	24	WK141	0.693	0.612	1.910	-0.383	0.180	1.238	-0.426	0.188	15.406	3.681
N	25	WK002	0.383	0.246	2.102	1.429	0.290	1.314	1.494	0.297	-10.706	-35.346
N	26	WK098	0.703	0.694	2.670	-0.384	0.172	1.798	-0.457	0.163	31.343	-0.648
N	27	WK099	0.658	0.560	1.663	-0.270	0.173	1.001	-0.366	0.155	2.477	-0.829
N	28	WK097	0.846	0.413	1.009	-1.566	0.256	0.547	-1.946	0.148	-3.917	-3.166
N	29	WK110	0.716	0.473	1.692	-0.173	0.355	1.117	-0.155	0.385	-0.100	-2.591
N	30	WK139	0.752	0.427	1.062	-0.872	0.211	0.585	-1.115	0.148	0.452	0.597
N	31	WK136	0.621	0.405	1.002	-0.147	0.184	0.548	-0.308	0.148	1.011	-3.954
N	32	WK027	0.912	0.679	1.933	-1.672	0.178	1.241	-1.718	0.148	-0.584	-3.660
O	33	WK224	0.243	0.319	1.846	1.606	0.143	0.998	1.727	0.142	-14.373	-5.915
N	34	WK143	0.910	0.620	1.530	-1.950	0.121	0.972	-1.913	0.148	-0.197	-2.126
N	35	WK032	0.721	0.667	2.992	-0.326	0.251	2.000	-0.408	0.242	1.428	-1.068
O	36	WK273	0.730	0.570	1.652	-0.607	0.177	0.992	-0.711	0.148	2.096	16.203
N	37	WK171	0.814	0.644	1.923	-0.926	0.214	1.190	-1.053	0.148	-0.860	-1.615
N	38	WK182	0.921	0.633	1.752	-1.834	0.212	1.114	-1.882	0.148	0.095	-1.973
N	39	WK001	0.399	0.694	2.750	0.486	0.081	1.687	0.405	0.064	-1.922	-34.751
N	40	WK127	0.865	0.633	1.697	-1.421	0.147	1.107	-1.419	0.148	-0.221	-1.100
O	41	WK228	0.791	0.609	1.907	-0.761	0.247	1.112	-0.960	0.148	-2.901	-3.795
O	42	WK246	0.939	0.716	2.159	-1.942	0.189	1.527	-1.871	0.148	-0.613	-5.826
N	43	WK043	0.896	0.465	1.092	-2.118	0.228	0.699	-2.119	0.148	-1.029	-2.657
N	44	WK071	0.513	0.515	2.152	0.450	0.228	1.390	0.393	0.229	-0.628	-8.192
N	45	WK034	0.119	0.209	2.302	2.123	0.086	1.141	2.465	0.081	-1.092	1.095
N	46	WK138	0.845	0.530	1.248	-1.547	0.166	0.824	-1.484	0.148	-0.705	-0.298
N	47	WK129	0.619	0.529	1.846	0.049	0.250	1.123	-0.049	0.227	4.293	-0.310
N	48	WK159	0.849	0.736	2.530	-1.108	0.160	1.707	-1.154	0.104	4.845	-1.401
O	49	WK206	0.790	0.700	2.130	-0.888	0.135	1.402	-0.948	0.082	2.852	-4.700
N	50	WK111	0.600	0.378	1.220	0.317	0.310	0.708	0.205	0.277	-12.530	-11.556

CAST Word Knowledge Item Statistics Separate Form 2

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK119	0.949	0.508	1.253	-2.636	0.214	0.644	-3.114	0.146	0.054	0.071
O	2	WK221	0.527	0.635	2.121	0.111	0.111	1.258	0.103	0.111	4.102	0.438
N	3	WK153	0.577	0.516	2.486	0.267	0.277	1.642	0.302	0.295	6.155	0.155
O	4	WK265	0.883	0.663	2.726	-1.026	0.326	2.000	-0.928	0.437	1.125	0.136
O	5	WK212	0.771	0.407	0.988	-1.216	0.131	0.524	-1.338	0.146	6.319	24.829
O	6	WK267	0.692	0.573	3.044	-0.097	0.331	1.980	-0.109	0.340	16.259	6.506
N	7	WK150	0.934	0.515	1.836	-1.590	0.413	0.758	-2.496	0.146	0.022	0.011
N	8	WK009	0.898	0.485	1.210	-1.981	0.186	0.648	-2.267	0.146	-1.775	-3.208
O	9	WK275	0.893	0.587	1.901	-1.353	0.269	0.955	-1.716	0.146	3.991	1.189
O	10	WK218	0.552	0.545	2.722	0.282	0.245	1.813	0.283	0.252	-0.988	0.039
N	11	WK129	0.611	0.553	1.976	0.006	0.218	1.203	0.014	0.230	3.002	-0.725
N	12	WK091	0.588	0.485	1.265	-0.063	0.145	0.706	-0.075	0.146	2.396	-0.999
N	13	WK173	0.523	0.270	2.264	1.084	0.407	1.641	1.189	0.425	-7.708	-4.208
N	14	WK110	0.731	0.466	1.280	-0.635	0.216	0.655	-0.873	0.146	0.203	-1.148
O	15	WK200	0.836	0.510	1.402	-1.225	0.219	0.734	-1.504	0.146	1.350	1.283
N	16	WK045	0.883	0.605	1.856	-1.353	0.223	1.002	-1.597	0.146	2.258	2.850
N	17	WK120	0.655	0.493	1.595	-0.133	0.246	0.988	-0.066	0.283	0.699	1.296
N	18	WK176	0.964	0.398	1.068	-3.339	0.203	0.500	-4.264	0.146	-0.507	-0.054
N	19	WK013	0.520	0.255	0.930	1.065	0.311	0.580	1.340	0.354	-6.265	-7.050
O	20	WK259	0.836	0.525	1.438	-1.281	0.170	0.769	-1.466	0.146	-0.066	0.761
N	21	WK041	0.944	0.709	2.022	-2.025	0.118	1.133	-2.198	0.146	-0.057	-0.553
N	22	WK047	0.625	0.281	0.684	-0.194	0.200	0.328	-0.454	0.146	-13.883	-7.177
N	23	WK020	0.447	0.047	1.617	2.551	0.422	0.035	3.912	0.000	-5.597	-1.268
N	24	WK160	0.919	0.512	1.263	-2.252	0.135	0.699	-2.428	0.146	-1.667	-0.841
N	25	WK152	0.832	0.693	2.330	-0.993	0.153	1.373	-1.086	0.146	-1.727	-0.622
N	26	WK114	0.715	0.558	1.695	-0.501	0.193	0.911	-0.646	0.146	-4.834	-0.571
N	27	WK137	0.946	0.779	2.837	-1.732	0.158	1.603	-1.926	0.146	-0.596	-0.578
N	28	WK067	0.935	0.623	1.854	-1.858	0.236	0.988	-2.169	0.146	-1.242	-0.076
N	29	WK049	0.867	0.631	1.929	-1.286	0.164	1.065	-1.438	0.146	-2.902	0.534
N	30	WK012	0.928	0.551	1.433	-2.175	0.151	0.820	-2.308	0.146	-1.181	-0.281
N	31	WK060	0.755	0.614	2.180	-0.574	0.222	1.476	-0.496	0.291	1.436	3.580
O	32	WK204	0.782	0.542	1.488	-0.897	0.193	0.817	-1.059	0.146	-2.036	-3.369
N	33	WK070	0.418	0.319	1.058	1.141	0.202	0.514	1.236	0.179	-0.254	-7.478
O	34	WK262	0.863	0.634	1.805	-1.372	0.108	1.066	-1.417	0.146	-0.227	0.592
O	35	WK233	0.362	0.489	2.107	0.880	0.156	1.357	0.953	0.167	-9.773	-19.035
N	36	WK054	0.806	0.556	1.394	-1.194	0.122	0.822	-1.216	0.146	0.465	0.255
N	37	WK066	0.943	0.525	1.458	-2.271	0.281	0.831	-2.521	0.146	-0.707	-0.148
O	38	WK227	0.799	0.706	2.724	-0.781	0.177	1.624	-0.890	0.127	3.862	2.100
N	39	WK190	0.851	0.630	1.879	-1.224	0.166	1.126	-1.295	0.146	-0.217	-0.035
N	40	WK165	0.898	0.670	2.438	-1.279	0.293	1.446	-1.466	0.146	0.143	-0.027
N	41	WK064	0.697	0.556	1.499	-0.543	0.153	0.887	-0.573	0.146	-0.312	-1.348
N	42	WK074	0.643	0.626	2.111	-0.241	0.159	1.218	-0.307	0.127	-1.224	-9.539
N	43	WK147	0.499	0.411	0.970	0.409	0.145	0.535	0.468	0.146	-1.202	2.292
N	44	WK042	0.681	0.436	1.378	-0.099	0.335	0.632	-0.583	0.146	-1.000	-6.326
N	45	WK081	0.322	0.446	2.412	1.105	0.175	1.473	1.169	0.171	-0.537	-2.196
O	46	WK239	0.665	0.618	1.970	-0.325	0.173	1.106	-0.412	0.124	5.678	7.349
N	47	WK100	0.904	0.692	2.087	-1.603	0.193	1.296	-1.600	0.146	-1.815	-0.897
N	48	WK001	0.420	0.639	3.021	0.483	0.137	2.000	0.492	0.130	2.507	-8.392
N	49	WK149	0.816	0.690	2.573	-0.870	0.226	1.583	-0.891	0.205	-0.400	-2.079
O	50	WK274	0.702	0.662	2.712	-0.378	0.223	1.622	-0.309	0.200	3.197	0.810

CAST Word Knowledge Item Statistics Separate Form 3

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK055	0.550	0.457	1.838	0.367	0.265	1.189	0.438	0.289	-5.769	7.480
N	2	WK029	0.513	0.218	1.604	1.277	0.399	0.787	1.413	0.391	-11.503	-1.505
O	3	WK215	0.182	0.449	2.454	1.508	0.089	1.267	1.690	0.081	4.153	-1.947
N	4	WK148	0.539	0.471	1.314	0.158	0.155	0.760	0.184	0.155	19.202	1.163
N	5	WK084	0.775	0.581	2.329	-0.526	0.324	1.797	-0.368	0.405	0.204	-0.409
N	6	WK154	0.901	0.380	0.955	-2.433	0.181	0.506	-2.743	0.141	0.300	-0.578
O	7	WK268	0.977	0.492	1.272	-3.429	0.201	0.615	-4.125	0.141	-0.076	-0.233
N	8	WK011	0.482	0.407	1.265	0.612	0.202	0.675	0.640	0.189	2.329	0.802
N	9	WK001	0.413	0.690	3.365	0.421	0.112	2.000	0.420	0.101	3.085	-28.351
N	10	WK051	0.838	0.546	2.119	-0.804	0.378	1.727	-0.535	0.500	0.990	-0.254
O	11	WK217	0.694	0.510	1.248	-0.664	0.121	0.717	-0.646	0.141	5.909	-1.201
N	12	WK080	0.771	0.400	1.076	-0.997	0.223	0.542	-1.301	0.141	-2.813	3.300
O	13	WK201	0.935	0.579	1.484	-2.189	0.199	0.856	-2.323	0.141	0.291	0.045
N	14	WK164	0.864	0.385	0.906	-2.068	0.183	0.483	-2.329	0.141	0.242	-0.613
N	15	WK162	0.959	0.469	1.118	-3.167	0.196	0.612	-3.474	0.141	0.339	-0.108
O	16	WK212	0.773	0.433	1.019	-1.177	0.165	0.572	-1.272	0.141	8.260	12.702
N	17	WK187	0.863	0.514	1.613	-1.287	0.273	0.809	-1.620	0.141	2.713	0.941
O	18	WK272	0.938	0.639	1.963	-1.902	0.224	1.115	-2.059	0.141	-0.332	-1.366
N	19	WK169	0.491	0.442	1.125	0.355	0.129	0.609	0.335	0.105	-12.183	-59.680
O	20	WK213	0.550	0.604	2.296	0.115	0.176	1.419	0.125	0.176	5.315	-1.087
O	21	WK261	0.932	0.591	1.815	-1.759	0.326	0.982	-2.081	0.141	0.605	0.010
N	22	WK039	0.460	0.474	2.465	0.673	0.250	1.579	0.707	0.254	0.792	-0.907
O	23	WK255	0.576	0.481	1.277	-0.000	0.161	0.732	-0.030	0.141	0.819	-2.739
N	24	WK079	0.963	0.600	1.581	-2.661	0.184	0.943	-2.722	0.141	0.012	-0.074
N	25	WK118	0.814	0.493	1.517	-1.013	0.254	0.767	-1.304	0.141	-0.222	3.530
N	26	WK057	0.898	0.551	1.389	-1.889	0.159	0.845	-1.895	0.141	0.165	0.088
O	27	WK248	0.793	0.498	1.585	-0.850	0.261	0.807	-1.122	0.141	-2.001	0.945
N	28	WK116	0.679	0.599	2.277	-0.277	0.227	1.510	-0.237	0.247	0.071	3.078
N	29	WK025	0.739	0.599	1.747	-0.696	0.158	1.060	-0.721	0.141	9.528	2.006
N	30	WK072	0.942	0.549	1.482	-2.347	0.173	0.873	-2.392	0.141	-0.014	0.556
O	31	WK247	0.547	0.546	1.640	0.101	0.155	0.926	0.042	0.119	0.319	1.452
O	32	WK211	0.807	0.638	1.922	-0.991	0.160	1.166	-1.019	0.141	0.754	1.430
N	33	WK163	0.694	0.464	1.247	-0.472	0.221	0.682	-0.651	0.141	-3.874	-12.761
N	34	WK018	0.846	0.653	2.073	-1.126	0.204	1.260	-1.193	0.141	3.012	-0.247
N	35	WK048	0.638	0.604	1.773	-0.290	0.144	1.002	-0.380	0.088	-4.767	-1.405
N	36	WK151	0.806	0.682	2.431	-0.879	0.181	1.479	-0.917	0.146	16.580	23.974
O	37	WK262	0.895	0.617	1.790	-1.594	0.207	1.158	-1.578	0.141	1.191	0.378
N	38	WK077	0.904	0.612	1.579	-1.839	0.186	1.062	-1.738	0.141	-0.044	-0.352
N	39	WK178	0.897	0.602	1.516	-1.854	0.153	0.998	-1.733	0.141	0.108	-0.190
N	40	WK110	0.700	0.537	1.695	-0.372	0.261	1.001	-0.480	0.190	-2.319	-2.917
N	41	WK129	0.632	0.573	2.145	-0.061	0.253	1.257	-0.123	0.210	12.783	0.071
O	42	WK243	0.791	0.542	1.274	-1.247	0.122	0.836	-1.118	0.141	1.616	-1.996
N	43	WK104	0.423	0.595	2.962	0.542	0.175	1.838	0.546	0.162	-2.338	2.157
N	44	WK082	0.769	0.660	1.969	-0.802	0.185	1.237	-0.851	0.104	-3.760	-1.126
O	45	WK231	0.416	0.613	2.165	0.494	0.126	1.289	0.480	0.101	-1.202	4.752
N	46	WK126	0.892	0.645	1.685	-1.768	0.192	1.236	-1.524	0.141	-0.993	-1.569
N	47	WK195	0.301	0.226	3.682	1.640	0.259	2.000	1.841	0.247	-6.604	-9.637
N	48	WK181	0.911	0.582	1.328	-2.419	0.170	0.986	-1.882	0.141	-0.114	-1.622
N	49	WK050	0.903	0.634	1.542	-2.150	0.152	1.140	-1.675	0.141	-0.388	-1.117
N	50	WK107	0.911	0.597	1.454	-2.366	0.178	1.021	-1.839	0.141	-0.008	-0.358

CAST Word Knowledge Item Statistics Separate Form 4

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	WK208	0.940	0.447	1.137	-2.713	0.165	0.616	-2.933	0.150	0.403	0.393
N	2	WK010	0.468	0.468	2.218	0.636	0.226	1.302	0.681	0.232	-3.764	-1.366
O	3	WK245	0.912	0.525	1.496	-1.783	0.281	0.799	-2.073	0.150	0.019	6.656
N	4	WK108	0.809	0.519	1.383	-1.103	0.208	0.793	-1.210	0.150	-0.378	-4.060
N	5	WK001	0.443	0.694	3.027	0.370	0.100	1.812	0.351	0.088	3.608	-19.210
N	6	WK021	0.942	0.470	1.217	-2.592	0.196	0.662	-2.830	0.150	0.083	-0.196
O	7	WK207	0.344	0.547	2.240	0.873	0.129	1.484	0.931	0.141	5.743	1.363
O	8	WK269	0.933	0.512	1.362	-2.288	0.184	0.746	-2.465	0.150	0.161	-0.740
N	9	WK073	0.452	0.532	2.427	0.601	0.197	1.516	0.626	0.202	-0.723	-4.955
N	10	WK088	0.660	0.508	2.043	-0.015	0.302	1.367	0.065	0.338	0.543	4.536
O	11	WK219	0.724	0.616	1.706	-0.673	0.125	1.022	-0.711	0.095	-0.551	1.804
O	12	WK262	0.887	0.570	1.620	-1.604	0.178	0.937	-1.667	0.150	0.871	2.657
N	13	WK167	0.976	0.623	1.866	-2.717	0.163	1.017	-2.907	0.150	-0.722	-0.010
N	14	WK093	0.632	0.284	0.647	-0.395	0.166	0.336	-0.476	0.150	-0.395	-0.014
N	15	WK083	0.738	0.548	1.550	-0.672	0.187	0.893	-0.742	0.150	-6.967	-1.083
N	16	WK092	0.521	0.539	2.543	0.406	0.232	1.569	0.423	0.238	-1.430	-0.053
O	17	WK212	0.784	0.435	1.063	-1.221	0.159	0.606	-1.260	0.150	7.535	26.705
N	18	WK004	0.965	0.604	1.686	-2.601	0.145	0.954	-2.702	0.150	0.005	-0.364
N	19	WK166	0.890	0.481	1.154	-2.054	0.140	0.677	-2.059	0.150	0.765	-0.658
O	20	WK216	0.656	0.603	1.661	-0.375	0.126	1.016	-0.376	0.119	-3.156	-2.263
O	21	WK250	0.790	0.564	1.591	-0.955	0.178	0.921	-1.005	0.150	-2.523	0.175
N	22	WK131	0.949	0.687	2.006	-2.115	0.145	1.238	-2.107	0.150	0.239	-1.455
N	23	WK033	0.916	0.735	2.787	-1.493	0.202	1.648	-1.549	0.150	4.262	0.399
O	24	WK266	0.919	0.611	1.705	-1.854	0.182	1.019	-1.896	0.150	-0.216	-0.605
N	25	WK179	0.906	0.556	1.524	-1.836	0.177	0.889	-1.895	0.150	-0.121	0.533
O	26	WK198	0.881	0.508	1.300	-1.757	0.184	0.751	-1.835	0.150	-1.018	-4.224
N	27	WK132	0.690	0.681	2.423	-0.375	0.172	1.630	-0.348	0.183	8.236	1.054
N	28	WK174	0.612	0.280	1.050	0.607	0.377	0.676	0.811	0.417	-0.748	10.429
N	29	WK068	0.713	0.596	1.656	-0.596	0.152	0.991	-0.632	0.121	3.969	-0.671
O	30	WK236	0.221	0.390	2.534	1.468	0.126	1.248	1.675	0.119	3.846	4.537
N	31	WK197	0.511	0.582	2.667	0.402	0.218	1.737	0.404	0.219	-1.314	-6.375
O	32	WK256	0.541	0.662	2.024	0.031	0.092	1.166	-0.017	0.060	-2.794	-1.527
N	33	WK040	0.806	0.659	1.989	-1.015	0.144	1.286	-0.961	0.150	2.705	1.883
N	34	WK188	0.847	0.649	1.869	-1.218	0.196	1.182	-1.218	0.150	0.416	-5.368
N	35	WK133	0.650	0.702	2.791	-0.210	0.177	1.912	-0.206	0.173	-6.280	-5.824
N	36	WK078	0.698	0.409	0.969	-0.596	0.220	0.573	-0.713	0.150	-0.221	3.235
N	37	WK183	0.934	0.644	1.651	-2.238	0.130	1.121	-2.001	0.150	0.044	-0.836
N	38	WK110	0.722	0.473	1.061	-0.911	0.135	0.685	-0.783	0.150	0.098	-9.499
O	39	WK237	0.925	0.646	1.692	-2.009	0.220	1.205	-1.808	0.150	-0.430	-1.947
N	40	WK076	0.848	0.717	2.197	-1.220	0.156	1.520	-1.131	0.150	0.817	-6.304
N	41	WK129	0.620	0.543	1.801	0.022	0.251	1.049	-0.043	0.210	2.247	-11.758
N	42	WK035	0.030	0.118	2.834	2.744	0.022	0.775	5.336	0.021	4.225	4.732
N	43	WK186	0.724	0.411	0.848	-1.027	0.170	0.530	-0.940	0.150	0.438	-4.013
N	44	WK090	0.630	0.542	1.300	-0.314	0.144	0.835	-0.245	0.150	1.033	1.330
N	45	WK086	0.758	0.769	3.126	-0.660	0.173	2.000	-0.676	0.113	0.050	-1.301
N	46	WK157	0.835	0.627	1.606	-1.362	0.171	1.124	-1.181	0.150	0.044	-13.378
N	47	WK096	0.851	0.738	2.423	-1.255	0.167	1.606	-1.189	0.080	3.342	1.035
O	48	WK257	0.551	0.606	2.159	0.160	0.193	1.262	0.096	0.140	5.724	-6.681
N	49	WK105	0.875	0.582	1.359	-1.896	0.188	0.982	-1.526	0.150	-0.158	-2.281
N	50	WK063	0.323	0.465	1.499	1.124	0.132	0.752	1.171	0.093	2.955	4.761

CAST Word Knowledge Item Statistics Separate Form 5

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK087	0.975	0.624	1.693	-2.863	0.186	0.870	-3.308	0.173	-0.521	-0.281
N	2	WK135	0.802	0.446	1.375	-0.830	0.317	1.120	-0.350	0.500	-0.109	2.177
O	3	WK238	0.963	0.619	1.555	-2.669	0.174	0.804	-3.056	0.173	-0.152	0.015
O	4	WK222	0.235	0.591	3.052	1.087	0.086	1.827	1.171	0.083	-6.342	-4.304
N	5	WK110	0.754	0.456	1.269	-0.699	0.255	0.641	-0.989	0.173	0.860	-3.424
N	6	WK003	0.405	0.467	1.557	0.747	0.145	0.854	0.802	0.141	-0.768	27.241
N	7	WK129	0.621	0.511	2.102	0.082	0.271	1.245	0.088	0.283	8.530	0.334
N	8	WK161	0.887	0.543	1.343	-1.818	0.131	0.712	-1.986	0.173	-0.282	0.014
N	9	WK140	0.699	0.369	0.798	-0.797	0.167	0.418	-0.894	0.173	-2.523	-1.452
N	10	WK128	0.445	0.390	1.682	0.886	0.245	0.962	0.965	0.250	-1.335	-3.158
N	11	WK007	0.773	0.483	1.248	-0.940	0.192	0.677	-1.084	0.173	-0.683	-2.903
N	12	WK117	0.694	0.485	1.420	-0.356	0.238	0.941	-0.202	0.315	0.193	0.885
N	13	WK106	0.947	0.586	1.469	-2.437	0.149	0.801	-2.658	0.173	-1.134	-0.682
O	14	WK262	0.903	0.596	2.062	-1.391	0.272	1.133	-1.640	0.173	0.795	0.819
N	15	WK196	0.940	0.475	1.394	-2.101	0.345	0.766	-2.510	0.173	-0.759	-1.318
O	16	WK212	0.753	0.393	1.271	-0.526	0.326	0.614	-0.985	0.173	4.775	26.103
N	17	WK109	0.959	0.583	1.482	-2.641	0.186	0.770	-3.012	0.173	-0.469	-0.248
N	18	WK001	0.436	0.648	4.054	0.397	0.127	2.000	0.381	0.108	1.088	-11.325
N	19	WK124	0.930	0.588	1.560	-2.050	0.190	0.871	-2.242	0.173	-0.335	-0.593
O	20	WK230	0.742	0.599	2.064	-0.513	0.229	1.250	-0.549	0.241	2.220	-1.309
N	21	WK058	0.905	0.524	1.313	-1.975	0.170	0.712	-2.182	0.173	-0.893	-0.558
N	22	WK046	0.729	0.522	1.716	-0.484	0.239	0.923	-0.660	0.173	6.421	11.853
N	23	WK101	0.842	0.680	2.135	-1.115	0.131	1.337	-1.134	0.173	7.307	1.751
O	24	WK225	0.935	0.734	2.244	-1.815	0.132	1.336	-1.902	0.173	-0.110	-1.180
O	25	WK254	0.613	0.575	2.065	-0.020	0.206	1.246	-0.039	0.211	0.451	5.049
N	26	WK008	0.827	0.469	1.326	-1.062	0.298	0.696	-1.421	0.173	-5.298	1.314
N	27	WK194	0.626	0.539	1.969	0.008	0.246	1.212	0.027	0.266	-2.298	-3.239
N	28	WK142	0.605	0.433	1.531	0.153	0.265	0.862	0.192	0.281	-7.404	-3.819
O	29	WK260	0.956	0.696	2.065	-2.174	0.162	1.253	-2.272	0.173	-0.177	-0.345
N	30	WK184	0.800	0.462	1.486	-0.795	0.309	0.711	-1.219	0.173	12.87[illegible]	7.486
O	31	WK226	0.907	0.582	1.551	-1.788	0.187	0.877	-1.944	0.173	-1.136	-0.172
N	32	WK089	0.938	0.664	2.404	-1.620	0.296	1.293	-1.920	0.173	0.777	0.564
O	33	WK229	0.782	0.687	2.432	-0.737	0.160	1.506	-0.806	0.153	1.229	0.960
O	34	WK252	0.953	0.651	1.787	-2.302	0.175	1.034	-2.424	0.173	-0.101	-1.060
N	35	WK156	0.567	0.402	1.045	0.132	0.180	0.558	0.122	0.173	1.254	3.196
O	36	WK234	0.541	0.526	2.044	0.336	0.238	1.202	0.316	0.227	-5.822	-0.638
N	37	WK014	0.429	0.555	2.265	0.564	0.157	1.347	0.601	0.160	2.475	-3.158
O	38	WK210	0.734	0.588	1.928	-0.531	0.208	1.146	-0.610	0.189	17.348	-2.822
N	39	WK053	0.948	0.615	1.968	-1.939	0.315	1.281	-2.047	0.173	-0.054	-2.067
N	40	WK022	0.193	0.291	3.278	1.644	0.139	1.996	1.920	0.138	-3.378	-10.413
N	41	WK075	0.792	0.454	1.013	-1.282	0.183	0.579	-1.358	0.173	-2.745	-5.591
N	42	WK121	0.655	0.517	1.782	-0.076	0.277	0.996	-0.152	0.249	-1.341	2.239
N	43	WK030	0.575	0.494	1.767	0.273	0.269	1.044	0.271	0.262	-8.225	-4.356
N	44	WK134	0.873	0.726	2.550	-1.163	0.234	1.909	-1.145	0.211	3.665	-0.063
N	45	WK085	0.855	0.672	2.188	-1.132	0.229	1.442	-1.174	0.173	1.097	-2.036
N	46	WK038	0.308	0.365	2.212	1.413	0.213	1.064	1.604	0.198	0.581	-12.443
N	47	WK024	0.888	0.745	2.245	-1.490	0.127	1.628	-1.361	0.173	0.096	0.866
N	48	WK191	0.947	0.722	1.953	-2.413	0.186	1.476	-1.980	0.173	-0.081	-2.834
O	49	WK205	0.872	0.712	2.356	-1.249	0.222	1.674	-1.223	0.173	0.586	-0.479
N	50	WK112	0.825	0.570	1.478	-1.223	0.236	0.962	-1.195	0.173	-0.330	-4.249

CAST Word Knowledge Item Statistics Separate Form 6

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK036	0.969	0.567	1.428	-2.946	0.167	0.766	-3.222	0.143	-0.151	-0.184
O	2	WK232	0.656	0.580	3.889	0.100	0.365	2.000	0.054	0.347	20.355	14.920
N	3	WK052	0.822	0.416	0.995	-1.454	0.227	0.556	-1.671	0.143	-1.150	-1.092
O	4	WK202	0.621	0.511	1.611	-0.015	0.242	0.911	-0.001	0.240	1.931	0.361
N	5	WK145	0.976	0.514	1.350	-3.312	0.149	0.704	-3.706	0.143	-0.231	-0.080
N	6	WK172	0.656	0.521	1.440	-0.321	0.178	0.785	-0.399	0.143	1.220	-1.565
N	7	WK028	0.957	0.560	1.388	-2.684	0.192	0.800	-2.802	0.143	0.624	0.708
O	8	WK212	0.743	0.413	1.015	-0.886	0.206	0.515	-1.122	0.143	7.682	20.087
O	9	WK242	0.919	0.557	1.419	-2.119	0.132	0.853	-2.109	0.143	0.147	1.000
O	10	WK223	0.262	0.536	2.279	1.132	0.100	1.240	1.287	0.100	2.491	2.624
N	11	WK031	0.357	0.631	2.983	0.647	0.107	1.783	0.715	0.112	11.009	23.248
N	12	WK001	0.421	0.659	3.133	0.455	0.128	1.885	0.487	0.127	4.248	-25.280
N	13	WK185	0.890	0.580	1.566	-1.674	0.160	0.924	-1.718	0.143	2.914	0.161
N	14	WK110	0.724	0.463	1.254	-0.525	0.270	0.659	-0.817	0.143	0.018	-5.690
O	15	WK244	0.932	0.674	2.113	-1.806	0.183	1.280	-1.850	0.143	-0.106	0.186
O	16	WK264	0.798	0.603	2.020	-0.794	0.252	1.316	-0.745	0.285	1.340	3.703
O	17	WK263	0.925	0.686	2.400	-1.628	0.209	1.541	-1.652	0.143	0.035	-3.459
N	18	WK180	0.944	0.571	1.607	-2.268	0.156	0.935	-2.325	0.143	-0.196	-0.524
N	19	WK129	0.633	0.533	1.861	-0.039	0.252	1.068	-0.023	0.258	3.690	-5.000
N	20	WK095	0.919	0.665	2.002	-1.019	0.174	1.235	-1.059	0.143	5.933	0.286
N	21	WK155	0.336	0.248	3.404	1.333	0.248	1.896	1.562	0.252	-8.756	-3.926
O	22	WK249	0.567	0.522	1.424	-0.012	0.134	0.735	-0.069	0.101	1.325	0.808
N	23	WK175	0.933	0.473	1.186	-2.551	0.155	0.647	-2.746	0.143	-1.781	-1.655
N	24	WK146	0.916	0.654	1.837	-1.763	0.172	1.116	-1.795	0.143	-0.082	-0.397
O	25	WK235	0.443	0.635	3.567	0.436	0.158	2.000	0.462	0.153	-2.437	19.068
N	26	WK103	0.912	0.435	1.038	-2.449	0.172	0.555	-2.704	0.143	-0.963	-1.739
O	27	WK203	0.842	0.513	1.313	-1.410	0.190	0.747	-1.528	0.143	-4.907	-2.264
N	28	WK015	0.654	0.614	2.012	-0.266	0.178	1.133	-0.306	0.162	-2.241	5.615
N	29	WK158	0.833	0.654	2.069	-1.064	0.186	1.269	-1.119	0.143	-0.563	-6.888
N	30	WK189	0.882	0.490	1.195	-1.895	0.169	0.695	-1.966	0.143	-1.300	-3.868
N	31	WK113	0.781	0.722	2.772	-0.722	0.179	1.732	-0.761	0.162	3.921	0.233
N	32	WK177	0.450	0.580	2.241	0.464	0.155	1.279	0.489	0.148	-0.441	8.025
N	33	WK069	0.856	0.443	1.076	-1.788	0.162	0.600	-1.892	0.143	0.084	2.767
N	34	WK123	0.843	0.513	1.191	-1.625	0.119	0.703	-1.601	0.143	-4.743	-3.288
N	35	WK125	0.502	0.508	1.633	0.359	0.175	0.831	0.348	0.147	-10.146	-3.538
O	36	WK209	0.653	0.751	3.001	-0.330	0.113	1.869	-0.367	0.095	6.608	-0.473
O	37	WK220	0.223	0.582	2.179	1.196	0.066	1.029	1.384	0.052	19.159	14.938
N	38	WK023	0.453	0.373	2.238	0.978	0.305	1.208	1.095	0.301	-7.345	2.396
O	39	WK270	0.942	0.644	1.724	-2.218	0.143	1.106	-2.114	0.143	-4.182	-1.419
N	40	WK193	0.370	0.657	2.213	0.563	0.073	1.164	0.578	0.049	15.018	-10.013
N	41	WK170	0.838	0.620	1.777	-1.189	0.199	1.101	-1.219	0.143	-0.436	-0.257
N	42	WK122	0.904	0.525	1.222	-2.178	0.165	0.799	-2.013	0.143	-4.452	-1.495
N	43	WK130	0.714	0.595	1.635	-0.630	0.159	1.018	-0.620	0.143	0.736	-1.961
N	44	WK026	0.460	0.643	2.990	0.392	0.165	1.695	0.383	0.141	4.400	1.909
N	45	WK044	0.368	0.263	1.888	1.550	0.283	0.732	1.883	0.253	-2.488	1.101
O	46	WK262	0.855	0.620	1.721	-1.419	0.167	1.159	-1.296	0.143	-0.345	-2.574
N	47	WK144	0.716	0.710	3.685	-0.304	0.307	2.000	-0.398	0.234	5.384	5.431
N	48	WK192	0.913	0.605	1.638	-2.063	0.170	1.048	-1.820	0.143	-1.281	-2.394
N	49	WK056	0.852	0.648	1.977	-1.276	0.215	1.293	-1.209	0.143	-2.785	-14.052
N	50	WK094	0.664	0.642	2.092	-0.332	0.199	1.166	-0.412	0.122	-6.138	-6.113

CAST Word Knowledge Item Statistics Separate Form 7

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	LOGIST a	LOGIST b	LOGIST c	Race chi-sq	Sex chi-sq
N	1	WK111	0.677	0.345	1.358	0.161	0.393	1.060	0.405	0.480	-3.564	-10.946
O	2	WK206	0.868	0.605	1.622	-1.509	0.110	1.031	-1.468	0.141	3.044	-0.038
N	3	WK159	0.913	0.716	2.486	-1.511	0.177	1.604	-1.531	0.141	0.811	-0.588
N	4	WK129	0.642	0.537	1.686	-0.178	0.193	1.077	-0.190	0.209	3.007	1.021
N	5	WK138	0.859	0.366	0.874	-1.997	0.208	0.479	-2.292	0.141	-0.093	0.060
N	6	WK034	0.151	0.221	2.157	2.160	0.113	2.000	2.260	0.122	-7.661	4.249
N	7	WK071	0.537	0.584	2.156	0.199	0.169	1.411	0.180	0.186	5.655	-9.415
N	8	WK043	0.913	0.372	0.922	-2.670	0.169	0.507	-2.924	0.141	0.420	-0.083
O	9	WK246	0.973	0.577	1.481	-3.024	0.169	0.837	-3.204	0.141	-0.040	0.021
O	10	WK228	0.843	0.599	1.883	-1.084	0.234	1.081	-1.259	0.141	-0.956	-1.401
N	11	WK127	0.886	0.520	1.427	-1.686	0.184	0.841	-1.782	0.141	0.240	0.707
N	12	WK001	0.402	0.696	3.340	0.468	0.093	2.000	0.407	0.085	9.866	-19.502
N	13	WK182	0.936	0.556	1.535	-2.169	0.184	0.907	-2.254	0.141	0.263	0.754
N	14	WK171	0.809	0.641	2.028	-0.932	0.176	1.264	-0.999	0.141	0.628	0.765
O	15	WK273	0.746	0.532	1.765	-0.490	0.280	1.119	-0.514	0.291	1.249	15.793
N	16	WK032	0.763	0.675	3.043	-0.512	0.252	2.000	-0.550	0.261	5.466	0.491
N	17	WK143	0.912	0.629	1.776	-1.767	0.155	1.117	-1.762	0.141	0.024	-0.662
O	18	WK224	0.187	0.282	1.800	1.982	0.121	0.894	2.254	0.119	-6.740	2.262
N	19	WK027	0.914	0.647	1.933	-1.643	0.214	1.245	-1.688	0.141	-0.007	-0.833
N	20	WK136	0.596	0.446	1.005	-0.211	0.111	0.616	-0.168	0.141	7.939	-1.595
N	21	WK139	0.752	0.449	1.039	-1.091	0.117	0.641	-1.056	0.141	2.316	3.098
N	22	WK110	0.733	0.487	1.660	-0.356	0.323	1.087	-0.340	0.349	0.030	-1.401
N	23	WK097	0.832	0.444	1.015	-1.615	0.169	0.606	-1.687	0.141	-2.271	-1.575
N	24	WK099	0.643	0.563	1.512	-0.342	0.121	0.893	-0.445	0.084	1.717	-0.447
N	25	WK098	0.719	0.665	2.923	-0.374	0.230	2.000	-0.416	0.233	27.913	2.708
N	26	WK002	0.386	0.296	1.372	1.394	0.242	1.044	1.467	0.277	-5.080	-20.866
N	27	WK141	0.662	0.601	1.937	-0.278	0.178	1.258	-0.316	0.179	5.461	5.142
N	28	WK115	0.967	0.657	1.766	-2.601	0.163	1.144	-2.539	0.141	-0.381	-0.079
N	29	WK005	0.874	0.605	1.771	-1.345	0.233	1.051	-1.490	0.141	-0.142	-0.407
N	30	WK168	0.972	0.547	1.357	-3.135	0.179	0.825	-3.151	0.141	-0.833	0.217
N	31	WK102	0.310	0.363	1.798	1.358	0.178	1.019	1.418	0.178	-0.967	-3.061
N	32	WK016	0.874	0.628	1.844	-1.396	0.167	1.183	-1.412	0.141	-0.094	0.189
O	33	WK271	0.955	0.572	1.503	-2.534	0.185	0.972	-2.468	0.141	-1.971	-0.388
O	34	WK240	0.913	0.622	1.773	-1.777	0.165	1.160	-1.745	0.141	-1.835	-0.892
O	35	WK241	0.855	0.576	1.910	-1.072	0.301	1.097	-1.318	0.141	-3.809	-2.336
N	36	WK037	0.476	0.605	2.268	0.383	0.151	1.430	0.320	0.144	1.239	-4.186
O	37	WK253	0.596	0.604	1.936	-0.051	0.159	1.169	-0.144	0.131	0.478	-0.316
N	38	WK061	0.912	0.619	1.587	-1.888	0.169	1.074	-1.794	0.141	-0.743	-2.468
O	39	WK199	0.955	0.645	1.643	-2.482	0.165	1.133	-2.290	0.141	-1.677	0.108
N	40	WK019	0.594	0.366	1.047	0.206	0.255	0.534	-0.153	0.141	-2.066	-1.335
N	41	WK062	0.784	0.480	1.056	-1.324	0.113	0.667	-1.240	0.141	-3.723	-0.794
O	42	WK212	0.774	0.445	0.970	-1.341	0.119	0.620	-1.231	0.141	2.643	12.681
O	43	WK258	0.508	0.510	3.563	0.496	0.270	2.000	0.405	0.246	2.649	6.572
N	44	WK006	0.585	0.432	1.111	0.021	0.185	0.651	-0.098	0.141	2.222	3.904
O	45	WK262	0.879	0.701	2.148	-1.439	0.140	1.548	-1.320	0.141	-1.127	1.464
N	46	WK059	0.941	0.661	1.857	-2.237	0.186	1.366	-1.904	0.141	-2.218	-0.374
N	47	WK065	0.719	0.623	2.199	-0.363	0.278	1.526	-0.403	0.256	-6.763	3.480
N	48	WK017	0.913	0.664	1.858	-1.897	0.152	1.277	-1.670	0.141	-0.180	-1.641
O	49	WK214	0.468	0.551	2.065	0.452	0.169	1.191	0.376	0.143	-9.489	-2.090
O	50	WK251	0.554	0.636	2.149	0.030	0.132	1.293	-0.050	0.098	13.272	14.575

CAST Word Knowledge Item Statistics Separate Form 8

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
O	1	WK274	0.720	0.619	2.227	-0.443	0.198	1.344	-0.467	0.217	1.170	-0.004
N	2	WK149	0.883	0.507	1.538	-1.412	0.289	0.736	-1.923	0.155	0.656	0.180
N	3	WK001	0.404	0.706	4.117	0.462	0.112	2.000	0.449	0.087	1.917	-6.014
N	4	WK100	0.948	0.608	1.669	-2.257	0.181	0.809	-2.746	0.155	-0.010	-0.021
O	5	WK239	0.725	0.549	1.661	-0.585	0.172	0.895	-0.698	0.155	4.179	1.692
N	6	WK081	0.306	0.419	2.182	1.154	0.158	1.264	1.259	0.160	2.557	2.159
N	7	WK042	0.692	0.388	1.000	-0.416	0.247	0.464	-0.818	0.155	-0.664	-11.064
N	8	WK147	0.513	0.341	0.803	0.426	0.152	0.393	0.514	0.155	3.298	0.145
N	9	WK074	0.698	0.625	1.982	-0.446	0.152	1.137	-0.507	0.153	-7.559	-3.292
N	10	WK064	0.728	0.537	1.674	-0.518	0.220	1.175	-0.321	0.331	-1.015	0.527
N	11	WK165	0.937	0.602	1.685	-2.034	0.201	0.835	-2.472	0.155	0.781	0.039
N	12	WK190	0.882	0.598	1.647	-1.564	0.130	0.899	-1.731	0.155	0.277	0.627
O	13	WK227	0.820	0.693	2.660	-0.870	0.175	1.534	-0.977	0.175	0.923	2.802
N	14	WK066	0.971	0.614	1.617	-2.770	0.212	0.750	-3.530	0.155	-0.005	-0.074
N	15	WK054	0.867	0.532	1.313	-1.688	0.111	0.711	-1.842	0.155	3.252	1.500
O	16	WK233	0.367	0.485	2.328	0.881	0.178	1.568	0.956	0.189	-10.005	-28.278
O	17	WK262	0.896	0.629	1.887	-1.548	0.155	0.978	-1.788	0.155	0.616	1.265
N	18	WK070	0.406	0.361	1.451	1.059	0.214	0.862	1.204	0.233	-1.150	-0.060
O	19	WK204	0.803	0.551	1.676	-0.904	0.221	0.872	-1.146	0.155	-1.514	-1.295
N	20	WK060	0.754	0.628	2.428	-0.529	0.228	1.394	-0.607	0.223	0.312	2.613
N	21	WK012	0.925	0.509	1.350	-2.207	0.159	0.676	-2.615	0.155	-0.489	0.039
N	22	WK049	0.895	0.639	2.242	-1.286	0.264	1.141	-1.624	0.155	-0.025	-0.107
N	23	WK067	0.931	0.518	1.415	-2.161	0.205	0.711	-2.615	0.155	-0.163	0.061
N	24	WK137	0.950	0.773	2.507	-1.962	0.111	1.373	-2.211	0.155	0.021	0.106
N	25	WK114	0.759	0.560	1.632	-0.775	0.161	0.874	-0.897	0.155	-0.893	0.734
N	26	WK152	0.819	0.636	2.269	-0.845	0.236	1.529	-0.744	0.344	0.527	-1.548
N	27	WK160	0.940	0.610	1.613	-2.218	0.142	0.888	-2.457	0.155	-0.035	0.087
N	28	WK020	0.442	0.055	2.657	1.936	0.412	2.000	2.093	0.413	-3.242	1.437
N	29	WK047	0.583	0.266	0.698	0.377	0.254	1.088	1.283	0.488	-6.595	-2.933
N	30	WK041	0.950	0.673	1.888	-2.173	0.165	1.004	-2.482	0.155	-0.434	0.192
O	31	WK259	0.863	0.524	1.465	-1.423	0.206	0.776	-1.691	0.155	-0.802	0.871
N	32	WK013	0.488	0.303	2.037	1.096	0.363	1.499	1.185	0.380	-2.831	-0.751
N	33	WK176	0.955	0.554	1.371	-2.718	0.161	0.692	-3.196	0.155	-1.380	-0.351
N	34	WK120	0.659	0.540	1.552	-0.330	0.160	0.863	-0.384	0.155	2.187	-4.875
N	35	WK045	0.870	0.642	1.776	-1.436	0.119	1.002	-1.552	0.155	1.897	1.134
O	36	WK200	0.826	0.577	1.777	-1.008	0.235	0.945	-1.246	0.155	2.239	0.240
N	37	WK110	0.720	0.544	1.501	-0.597	0.181	0.845	-0.697	0.155	-4.707	-4.378
N	38	WK173	0.525	0.348	1.158	0.692	0.275	0.634	0.741	0.272	-4.071	-3.268
N	39	WK091	0.576	0.553	1.451	-0.045	0.128	0.797	-0.126	0.096	2.443	-4.389
N	40	WK129	0.603	0.494	1.690	0.088	0.242	0.957	0.058	0.230	3.060	-1.901
O	41	WK218	0.574	0.589	2.930	0.188	0.242	1.751	0.132	0.216	0.048	-1.984
O	42	WK275	0.823	0.640	1.772	-1.103	0.166	1.041	-1.184	0.155	2.214	0.427
N	43	WK009	0.834	0.538	1.178	-1.591	0.132	0.712	-1.558	0.155	-0.212	-1.098
N	44	WK150	0.904	0.705	2.839	-1.270	0.332	1.629	-1.504	0.155	0.080	0.042
O	45	WK267	0.671	0.596	2.338	-0.171	0.261	1.350	-0.259	0.217	5.360	1.697
O	46	WK212	0.758	0.478	1.033	-1.174	0.129	0.618	-1.117	0.155	5.077	14.619
O	47	WK265	0.855	0.755	2.685	-1.145	0.141	1.686	-1.182	0.155	0.515	-0.907
N	48	WK153	0.548	0.560	2.681	0.346	0.273	1.706	0.328	0.256	7.051	1.980
O	49	WK221	0.513	0.690	2.147	0.095	0.081	1.251	0.041	0.049	0.881	-3.108
N	50	WK119	0.877	0.659	1.752	-1.559	0.196	1.117	-1.511	0.155	-1.487	-1.810

CAST Word Knowledge Item Statistics Separate Form 9

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK107	0.976	0.477	1.245	-3.459	0.189	0.607	-4.184	0.141	0.004	0.130
N	2	WK050	0.979	0.520	1.301	-3.509	0.190	0.647	-4.184	0.141	0.043	-0.079
N	3	WK181	0.973	0.596	1.540	-3.024	0.150	0.816	-3.346	0.141	0.024	0.061
N	4	WK195	0.241	0.320	1.870	1.661	0.153	0.807	1.893	0.133	0.116	-2.762
N	5	WK126	0.963	0.492	1.199	-3.098	0.201	0.642	-3.513	0.141	0.055	-0.313
O	6	WK231	0.416	0.551	2.605	0.671	0.176	1.605	0.627	0.167	-0.695	5.806
N	7	WK082	0.818	0.496	1.582	-0.849	0.329	0.783	-1.305	0.141	-1.178	0.710
N	8	WK104	0.444	0.597	2.525	0.500	0.150	1.611	0.452	0.143	-0.776	4.932
O	9	WK243	0.861	0.473	1.073	-1.890	0.118	0.601	-1.982	0.141	0.364	-0.208
N	10	WK129	0.601	0.566	1.878	0.058	0.216	1.186	0.023	0.216	9.396	-1.857
N	11	WK110	0.731	0.481	1.584	-0.354	0.320	1.069	-0.237	0.381	0.004	-1.311
N	12	WK178	0.928	0.460	1.072	-2.613	0.189	0.619	-2.778	0.141	-0.015	-0.156
N	13	WK077	0.923	0.525	1.269	-2.247	0.197	0.756	-2.363	0.141	-0.074	-0.287
O	14	WK262	0.912	0.559	1.733	-1.593	0.310	0.984	-1.881	0.141	-0.121	2.067
N	15	WK151	0.820	0.622	1.848	-1.000	0.198	1.137	-1.098	0.141	14.029	22.116
N	16	WK048	0.678	0.604	1.719	-0.409	0.150	1.091	-0.440	0.144	-3.330	-1.301
N	17	WK018	0.847	0.582	1.575	-1.338	0.158	0.916	-1.418	0.141	2.724	0.236
N	18	WK163	0.721	0.444	1.201	-0.489	0.268	0.603	-0.884	0.141	-5.985	-9.076
O	19	WK211	0.815	0.637	2.171	-0.819	0.256	1.366	-0.870	0.250	0.546	0.013
O	20	WK247	0.551	0.511	1.625	0.234	0.197	0.957	0.191	0.189	0.928	0.342
N	21	WK072	0.946	0.623	1.719	-2.196	0.201	0.993	-2.358	0.141	0.398	0.073
N	22	WK025	0.736	0.685	2.151	-0.618	0.135	1.373	-0.672	0.117	9.534	2.382
N	23	WK116	0.651	0.546	1.443	-0.338	0.141	0.886	-0.372	0.141	-0.837	0.245
O	24	WK248	0.766	0.534	1.548	-0.733	0.228	0.875	-0.930	0.141	0.042	5.157
N	25	WK057	0.889	0.563	1.428	-1.743	0.176	0.867	-1.807	0.141	1.137	0.370
N	26	WK118	0.786	0.583	1.839	-0.718	0.263	1.285	-0.618	0.326	-0.952	0.121
N	27	WK079	0.958	0.691	1.911	-2.387	0.153	1.262	-2.333	0.141	-0.323	-0.654
O	28	WK255	0.571	0.495	1.302	0.043	0.151	0.759	-0.012	0.141	3.892	-1.443
N	29	WK039	0.474	0.405	2.987	0.859	0.314	2.000	0.837	0.314	-0.478	-2.263
O	30	WK261	0.934	0.680	1.891	-1.963	0.189	1.189	-2.006	0.141	0.374	0.178
O	31	WK213	0.557	0.583	2.412	0.242	0.223	1.515	0.188	0.215	8.490	0.639
N	32	WK169	0.489	0.430	1.086	0.422	0.134	0.625	0.431	0.141	-9.772	-73.553
O	33	WK272	0.913	0.694	1.978	-1.686	0.185	1.293	-1.702	0.141	-1.974	-1.166
N	34	WK187	0.849	0.549	1.418	-1.352	0.214	0.831	-1.502	0.141	0.210	1.804
O	35	WK212	0.755	0.468	1.092	-0.967	0.174	0.638	-1.075	0.141	5.878	13.849
N	36	WK162	0.939	0.519	1.112	-2.824	0.173	0.699	-2.759	0.141	-0.454	-0.109
N	37	WK164	0.845	0.514	1.102	-1.730	0.128	0.695	-1.667	0.141	-0.386	0.268
O	38	WK201	0.943	0.646	1.526	-2.417	0.170	0.989	-2.325	0.141	-0.028	-0.494
N	39	WK080	0.797	0.430	0.902	-1.479	0.173	0.553	-1.506	0.141	-1.113	2.454
O	40	WK217	0.642	0.540	1.257	-0.418	0.108	0.798	-0.365	0.141	2.912	-5.622
N	41	WK051	0.789	0.655	2.239	-0.694	0.266	1.510	-0.724	0.241	0.237	-1.179
N	42	WK001	0.387	0.710	3.874	0.565	0.114	2.000	0.488	0.082	-1.921	-12.925
N	43	WK011	0.442	0.482	1.630	0.669	0.179	0.929	0.596	0.150	1.185	8.137
O	44	WK268	0.947	0.616	1.571	-2.501	0.235	1.058	-2.276	0.141	-1.330	-1.787
N	45	WK154	0.892	0.531	1.267	-1.955	0.233	0.803	-1.911	0.141	-0.468	-0.456
N	46	WK084	0.694	0.641	2.179	-0.321	0.237	1.426	-0.368	0.208	-2.309	-3.621
N	47	WK148	0.526	0.476	1.155	0.202	0.141	0.685	0.208	0.141	6.063	3.192
O	48	WK215	0.190	0.483	2.020	1.493	0.080	0.999	1.615	0.064	1.352	-3.618
N	49	WK029	0.511	0.307	1.362	1.042	0.353	0.739	0.980	0.320	-13.964	-1.667
N	50	WK055	0.558	0.480	2.013	0.429	0.301	1.224	0.374	0.279	-4.929	-2.338

CAST Word Knowledge Item Statistics Separate Form 10

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	LOGIST a	LOGIST b	LOGIST c	Race chi-sq	Sex chi-sq
N	1	WK063	0.340	0.461	1.692	0.987	0.135	0.922	1.002	0.122	6.125	0.628
N	2	WK105	0.933	0.460	1.113	-2.632	0.194	0.675	-2.625	0.148	0.272	0.825
O	3	WK257	0.565	0.621	2.045	0.029	0.146	1.346	0.011	0.143	3.196	0.543
N	4	WK096	0.878	0.635	2.274	-1.168	0.313	1.631	-0.995	0.387	3.362	4.970
N	5	WK157	0.906	0.415	1.005	-2.356	0.223	0.593	-2.456	0.148	0.272	-1.158
N	6	WK086	0.807	0.672	3.157	-0.644	0.317	2.000	-0.640	0.317	0.200	0.056
N	7	WK090	0.606	0.419	1.070	-0.129	0.171	0.614	-0.183	0.148	3.109	0.663
N	8	WK186	0.772	0.322	0.693	-1.573	0.171	0.395	-1.662	0.148	0.088	-2.670
N	9	WK035	0.044	0.110	3.364	2.298	0.031	1.516	2.982	0.029	1.039	9.499
N	10	WK129	0.610	0.514	1.777	0.007	0.224	1.165	0.044	0.245	3.700	-1.177
N	11	WK076	0.867	0.583	1.524	-1.533	0.170	0.959	-1.487	0.148	3.415	0.025
O	12	WK237	0.957	0.580	1.569	-2.546	0.194	0.925	-2.551	0.148	0.083	-0.328
N	13	WK110	0.765	0.511	1.435	-0.783	0.237	0.832	-0.926	0.148	-0.284	-2.493
N	14	W[illegible]33	0.970	0.516	1.356	-3.123	0.178	0.796	-3.126	0.148	0.242	-0.008
N	15	WK078	0.731	0.345	0.902	-0.680	0.281	0.489	-1.065	0.148	-0.132	-0.671
N	16	WK133	0.669	0.661	2.624	-0.261	0.198	1.964	-0.234	0.213	-2.550	-2.656
N	17	WK138	0.846	0.642	2.145	-1.074	0.244	1.502	-0.920	0.306	2.115	0.409
N	18	WK040	0.83[illegible]	0.625	2.040	-1.018	0.233	1.407	-0.875	0.289	3.040	2.379
O	19	WK256	0.558	0.638	1.945	-0.022	0.107	1.163	-0.081	0.077	7.342	-2.180
N	20	WK197	0.534	0.579	2.410	0.242	0.195	1.656	0.237	0.205	-0.822	1.561
O	21	WK236	0.212	0.535	2.380	1.289	0.083	1.433	1.318	0.080	-1.978	3.935
N	22	WK068	0.728	0.508	1.332	-0.719	0.180	0.814	-0.751	0.148	4.323	-1.418
N	23	WK174	0.578	0.254	0.741	0.480	0.275	0.338	-0.032	0.148	-0.674	5.944
N	24	WK132	0.736	0.684	2.485	-0.553	0.187	1.722	-0.515	0.197	2.626	2.885
O	25	WK198	0.892	0.554	1.443	-1.783	0.197	0.899	-1.749	0.148	-2.412	-1.553
N	26	WK179	0.899	0.544	1.248	-2.063	0.173	0.823	-1.915	0.148	0.053	-0.392
O	27	WK266	0.913	0.682	1.888	-1.806	0.154	1.246	-1.682	0.148	-0.274	-0.653
N	28	WK033	0.908	0.700	2.321	-1.541	0.218	1.501	-1.503	0.148	1.472	0.747
N	29	WK131	0.936	0.657	1.703	-2.107	0.227	1.219	-1.921	0.148	1.224	0.063
O	30	WK250	0.778	0.546	1.504	-0.892	0.213	0.908	-0.961	0.148	-4.349	0.624
O	31	WK216	0.658	0.700	2.466	-0.337	0.130	1.623	-0.350	0.112	-1.622	-3.538
N	32	WK166	0.866	0.468	1.001	-2.059	0.153	0.654	-1.876	0.148	-0.031	-1.013
N	33	WK004	0.958	0.675	1.656	-2.661	0.150	1.213	-2.287	0.148	-0.182	-1.020
O	34	WK212	0.762	0.478	1.165	-0.986	0.194	0.736	-0.991	0.148	9.824	28.661
N	35	WK092	0.518	0.564	2.277	0.331	0.207	1.373	0.276	0.187	-10.008	-0.213
N	36	WK083	0.721	0.618	1.725	-0.646	0.156	1.082	-0.723	0.067	-2.315	0.121
N	37	WK093	0.570	0.340	0.812	0.202	0.210	0.471	0.024	0.148	1.675	-0.521
N	38	WK167	0.945	0.691	1.664	-2.463	0.169	1.339	-1.981	0.148	-0.589	-1.066
O	39	WK262	0.913	0.705	1.953	-1.829	0.199	1.501	-1.553	0.148	0.253	-1.834
O	40	WK219	0.688	0.658	2.173	-0.407	0.186	1.421	-0.436	0.139	-1.426	0.114
N	41	WK088	0.648	0.593	2.581	-0.060	0.282	1.814	-0.079	0.262	1.641	-3.361
N	42	WK073	0.471	0.481	1.991	0.603	0.230	1.164	0.543	0.203	-4.403	-7.816
O	43	WK269	0.894	0.635	1.618	-1.833	0.206	1.189	-1.537	0.148	0.420	-2.644
O	44	WK207	0.366	0.494	2.094	0.881	0.170	1.253	0.846	0.152	2.819	2.901
N	45	WK021	0.873	0.529	1.192	-1.967	0.209	0.843	-1.646	0.148	-0.213	-1.101
N	46	WK001	0.405	0.732	2.714	0.387	0.067	1.730	0.340	0.043	0.096	-23.802
N	47	WK108	0.721	0.574	1.589	-0.611	0.229	1.065	-0.595	0.164	-3.851	-9.369
O	48	WK245	0.855	0.646	1.790	-1.479	0.194	1.228	-1.251	0.148	-1.186	0.550
N	49	WK010	0.458	0.560	2.489	0.543	0.214	1.568	0.500	0.189	-0.614	-2.865
O	50	WK208	0.883	0.587	1.703	-1.855	0.242	1.053	-1.533	0.148	0.394	-3.751

CAST Word Knowledge Item Statistics Separate Form 11

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	LOGIST a	LOGIST b	LOGIST c	Race chi-sq	Sex chi-sq
N	1	WK112	0.826	0.455	1.150	-1.334	0.220	0.623	-1.551	0.172	-0.100	-1.173
O	2	WK205	0.888	0.612	2.029	-1.352	0.230	1.132	-1.525	0.172	5.506	2.509
N	3	WK191	0.983	0.574	1.611	-3.231	0.206	0.761	-3.974	0.172	-0.040	-0.051
N	4	WK024	0.943	0.630	1.973	-1.910	0.252	1.050	-2.190	0.172	0.164	1.149
N	5	WK038	0.324	0.262	1.804	1.655	0.238	0.889	1.985	0.239	3.571	-3.352
N	6	WK085	0.901	0.470	1.689	-1.376	0.382	0.798	-1.945	0.172	0.242	0.470
N	7	WK134	0.905	0.575	1.965	-1.397	0.322	1.019	-1.741	0.172	0.665	0.170
N	8	WK030	0.624	0.540	1.729	-0.073	0.210	1.056	-0.058	0.223	-3.679	-4.920
N	9	WK121	0.621	0.406	2.356	0.391	0.395	1.584	0.438	0.412	-0.627	1.418
N	10	WK075	0.746	0.390	1.017	-0.864	0.217	0.532	-1.074	0.172	-1.887	-4.954
N	11	WK022	0.174	0.209	2.956	1.966	0.139	1.783	2.333	0.138	-11.698	-6.825
N	12	WK053	0.960	0.529	1.607	-2.470	0.224	0.928	-2.631	0.172	-0.171	-0.066
O	13	WK210	0.741	0.555	1.664	-0.647	0.191	0.952	-0.721	0.172	21.297	-3.102
N	14	WK014	0.425	0.494	2.394	0.675	0.197	1.378	0.704	0.193	4.785	-2.836
O	15	WK234	0.491	0.474	1.677	0.501	0.207	0.946	0.502	0.196	-2.406	0.141
N	16	WK156	0.571	0.391	1.021	0.174	0.203	0.528	0.099	0.172	2.655	1.915
O	17	WK252	0.946	0.613	1.716	-2.292	0.114	0.944	-2.409	0.172	-1.085	-1.097
O	18	WK229	0.822	0.593	1.847	-1.003	0.206	1.095	-1.095	0.172	7.504	4.379
N	19	WK089	0.940	0.691	2.129	-1.889	0.185	1.280	-1.977	0.172	0.396	-0.149
O	20	WK226	0.901	0.555	1.354	-1.940	0.154	0.787	-2.002	0.172	-1.455	0.598
N	21	WK184	0.804	0.446	1.253	-1.048	0.249	0.665	-1.307	0.172	11.361	5.595
O	22	WK260	0.960	0.669	2.377	-2.049	0.233	1.415	-2.186	0.172	-0.461	-0.013
N	23	WK142	0.562	0.436	1.464	0.334	0.256	0.862	0.377	0.265	-7.385	0.349
N	24	WK194	0.639	0.487	2.048	0.117	0.324	1.416	0.185	0.357	-3.191	0.353
N	25	WK008	0.824	0.598	1.877	-0.984	0.227	1.100	-1.104	0.172	-0.994	-0.694
O	26	WK254	0.592	0.568	2.048	0.034	0.197	1.210	-0.018	0.176	7.637	3.651
O	27	WK225	0.930	0.729	2.388	-1.671	0.207	1.467	-1.756	0.172	-2.340	-0.275
N	28	WK101	0.871	0.647	2.037	-1.287	0.184	1.225	-1.354	0.172	7.055	0.378
N	29	WK046	0.759	0.512	1.332	-0.908	0.156	0.800	-0.905	0.172	3.628	11.964
N	30	WK058	0.899	0.521	1.239	-2.047	0.145	0.718	-2.090	0.172	-0.754	-0.453
O	31	WK230	0.740	0.633	2.058	-0.617	0.162	1.231	-0.682	0.140	2.318	-2.608
N	32	WK124	0.923	0.554	1.680	-1.784	0.278	0.951	-1.999	0.172	-1.198	-0.755
N	33	WK001	0.386	0.682	3.812	0.499	0.107	2.000	0.487	0.082	4.390	-24.354
N	34	WK109	0.968	0.630	1.845	-2.540	0.201	1.082	-2.653	0.172	-1.452	-0.087
O	35	WK212	0.752	0.414	1.010	-1.000	0.181	0.559	-1.078	0.172	1.992	15.754
N	36	WK196	0.918	0.618	1.872	-1.695	0.242	1.121	-1.810	0.172	-3.143	-2.258
O	37	WK262	0.904	0.640	1.920	-1.637	0.172	1.228	-1.622	0.172	0.087	-0.142
N	38	WK106	0.944	0.643	1.618	-2.349	0.138	0.991	-2.309	0.172	-0.564	-0.479
N	39	WK117	0.680	0.479	1.171	-0.501	0.176	0.675	-0.523	0.172	4.444	-4.347
N	40	WK007	0.764	0.487	1.198	-0.996	0.167	0.720	-0.989	0.172	-3.249	-1.091
N	41	WK128	0.415	0.479	2.671	0.796	0.232	1.517	0.840	0.223	-0.978	-8.364
N	42	WK140	0.618	0.383	0.970	-0.010	0.242	0.493	-0.211	0.172	-1.824	-5.480
N	43	WK161	0.871	0.610	1.770	-1.349	0.251	1.107	-1.406	0.172	-1.136	-0.529
N	44	WK129	0.599	0.541	1.794	0.067	0.235	1.038	-0.001	0.198	9.706	-3.170
N	45	WK003	0.412	0.483	1.299	0.680	0.124	0.620	0.601	0.055	-2.071	14.949
N	46	WK110	0.699	0.523	1.325	-0.571	0.185	0.823	-0.561	0.172	0.049	-7.115
O	47	WK222	0.186	0.597	3.261	1.188	0.064	1.635	1.344	0.054	-5.129	0.602
O	48	WK238	0.907	0.657	1.861	-1.758	0.208	1.262	-1.619	0.172	-1.044	-3.301
N	49	WK135	0.784	0.600	1.658	-0.931	0.190	1.094	-0.891	0.172	-7.845	-0.528
N	50	WK087	0.932	0.642	2.070	-1.998	0.253	1.324	-1.828	0.172	-1.360	-2.075

CAST Word Knowledge Item Statistics Separate Form 12

					BILOG			LOGIST			Race	Sex
S	Pos	Num	PctCor	Bis	a	b	c	a	b	c	chi-sq	chi-sq
N	1	WK094	0.716	0.593	1.994	-0.391	0.235	1.162	-0.479	0.211	-1.003	-7.041
N	2	WK056	0.926	0.651	1.699	-1.926	0.185	0.965	-2.126	0.111	0.099	-3.436
N	3	WK192	0.970	0.512	1.323	-3.168	0.173	0.672	-3.673	0.111	-0.046	-0.466
N	4	WK144	0.769	0.660	2.864	-0.505	0.267	2.000	-0.475	0.314	9.173	5.237
O	5	WK262	0.919	0.630	2.051	-1.592	0.251	1.037	-1.948	0.111	-0.239	-0.232
N	6	WK044	0.317	0.289	2.314	1.345	0.210	1.073	1.629	0.206	-6.388	-3.016
N	7	WK026	0.438	0.599	3.638	0.503	0.172	2.000	0.515	0.167	0.575	5.409
N	8	WK130	0.739	0.492	1.349	-0.674	0.209	0.678	-0.961	0.111	0.733	-1.938
N	9	WK122	0.941	0.407	0.947	-3.082	0.193	0.488	-3.640	0.111	-0.194	-0.058
N	10	WK170	0.897	0.651	1.896	-1.547	0.163	1.092	-1.692	0.111	-0.053	-0.995
N	11	WK193	0.387	0.639	2.468	0.584	0.105	1.328	0.593	0.091	11.118	-3.165
O	12	WK270	0.964	0.596	1.515	-2.759	0.157	0.814	-3.058	0.111	-0.240	-0.022
N	13	WK023	0.506	0.330	2.150	0.955	0.360	1.211	1.138	0.376	-8.515	-3.220
O	14	WK220	0.230	0.534	2.181	1.178	0.069	1.032	1.385	0.061	19.666	6.720
O	15	WK209	0.717	0.699	3.103	-0.388	0.196	2.000	-0.408	0.214	4.752	2.319
N	16	WK125	0.500	0.461	1.589	0.504	0.212	0.805	0.531	0.199	-10.123	-9.698
N	17	WK123	0.857	0.343	0.780	-2.307	0.141	0.380	-2.803	0.111	-2.956	-0.151
N	18	WK069	0.876	0.324	0.743	-2.622	0.158	0.371	-3.160	0.111	-0.109	0.399
N	19	WK177	0.457	0.583	2.629	0.477	0.170	1.380	0.461	0.152	-0.688	9.488
N	20	WK113	0.840	0.709	2.579	-0.968	0.189	1.625	-0.995	0.212	1.840	-1.592
N	21	WK189	0.899	0.519	1.275	-1.971	0.159	0.698	-2.187	0.111	0.070	-2.159
N	22	WK158	0.855	0.699	2.558	-1.003	0.240	1.743	-0.971	0.294	-0.417	-5.944
N	23	WK015	0.701	0.582	2.006	-0.317	0.242	1.342	-0.239	0.298	0.030	12.992
O	24	WK203	0.866	0.565	1.531	-1.403	0.210	0.802	-1.705	0.111	-4.192	-2.337
N	25	WK103	0.907	0.476	1.086	-2.359	0.129	0.612	-2.511	0.111	-1.274	-2.578
O	26	WK235	0.469	0.666	2.816	0.325	0.125	1.623	0.303	0.116	2.543	24.655
N	27	WK146	0.918	0.664	1.791	-1.825	0.141	1.042	-1.939	0.111	-0.135	-0.453
N	28	WK175	0.961	0.595	1.475	-2.766	0.150	0.821	-2.973	0.111	-0.041	-1.796
O	29	WK249	0.593	0.452	1.064	-0.140	0.130	0.555	-0.201	0.111	2.723	-0.810
N	30	WK155	0.338	0.304	2.913	1.217	0.228	1.546	1.429	0.230	-17.681	-2.253
N	31	WK095	0.839	0.650	2.073	-1.019	0.224	1.134	-1.239	0.111	3.653	0.366
N	32	WK129	0.651	0.480	1.697	0.040	0.310	0.957	-0.019	0.291	-0.015	-6.643
N	33	WK180	0.942	0.511	1.154	-2.782	0.171	0.688	-2.863	0.111	-0.270	-0.563
O	34	WK263	0.932	0.737	2.133	-1.919	0.088	1.385	-1.885	0.111	-0.214	-3.715
O	35	WK264	0.792	0.578	1.692	-0.845	0.226	0.901	-1.099	0.111	0.899	0.564
O	36	WK244	0.906	0.662	1.775	-1.728	0.145	1.099	-1.773	0.111	-0.836	-1.618
N	37	WK110	0.765	0.419	1.122	-0.744	0.302	0.533	-1.322	0.111	0.484	-4.554
N	38	WK185	0.880	0.606	1.588	-1.554	0.179	0.912	-1.707	0.111	1.677	1.786
N	39	WK001	0.454	0.700	3.095	0.336	0.111	1.759	0.307	0.097	-4.178	-50.380
N	40	WK031	0.402	0.595	2.743	0.611	0.149	1.455	0.639	0.137	1.665	14.904
O	41	WK223	0.287	0.597	2.121	0.952	0.081	0.973	1.052	0.055	8.429	11.753
O	42	WK242	0.889	0.679	1.996	-1.513	0.174	1.354	-1.489	0.111	0.889	0.589
O	43	WK212	0.767	0.505	1.170	-1.085	0.146	0.692	-1.131	0.111	7.952	19.725
N	44	WK028	0.936	0.698	1.745	-2.254	0.173	1.289	-1.968	0.111	-0.056	-2.079
N	45	WK172	0.662	0.573	1.482	-0.404	0.149	0.861	-0.473	0.111	0.840	-2.865
N	46	WK145	0.935	0.711	1.884	-2.203	0.168	1.508	-1.845	0.111	-1.950	-3.943
O	47	WK202	0.656	0.563	1.601	-0.262	0.209	0.868	-0.438	0.111	1.079	-16.914
N	48	WK052	0.788	0.571	1.256	-1.263	0.121	0.823	-1.150	0.111	-1.414	-8.250
O	49	WK232	0.673	0.646	2.502	-0.197	0.258	1.505	-0.274	0.207	6.604	1.732
N	50	WK036	0.906	0.650	1.767	-1.885	0.206	1.206	-1.596	0.111	-0.597	-6.357

Appendix C

Item Statistics

For Combined CAST Arithmetic Reasoning and Word Knowledge Forms

Note:	Source of item	(S)	Position of item	(Pos)
	Master number	(Num)		
	Percent correct	(PctCor)	Biserial corr	(Bis)
	BILOG _a_ estimates	(a)		
	_b_ "	(b)		
	_c_ "	(c)		
	Race bias chi-sq	(chi-sq)	Sex bias chi-sq	(chi-sq)
	ICC signed	(ICCS)	ICC signed	(ICCS)
	ICC absolute	(ICCA)	ICC absolute	(ICCA)

CAST Arithmetic Reasoning Item Statistics for Combined Form 1

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
O	1	AR193	0.229	0.315	2.413	1.803	0.181	-8.826	-0.035	0.035	-2.606	-0.031	0.033
N	2	AR021	0.806	0.426	0.965	-1.630	0.132	-2.364	-0.082	0.082	-1.097	-0.014	0.025
O	3	AR101	0.239	0.459	2.119	1.482	0.141	2.755	0.014	0.015	2.510	0.011	0.029
O	4	AR173	0.749	0.578	1.404	-1.041	0.070	2.317	0.007	0.014	3.595	0.038	0.038
N	5	AR010	0.713	0.558	1.378	-0.798	0.115	-2.521	-0.085	0.092	-1.510	-0.022	0.031
N	6	AR033	0.243	0.317	2.008	1.810	0.181	-4.369	-0.017	0.022	1.399	-0.006	0.041
N	7	AR028	0.727	0.605	1.597	-0.767	0.127	-1.014	-0.064	0.064	2.958	0.035	0.037
O	8	AR224	0.368	0.433	2.235	1.182	0.245	2.997	0.041	0.045	2.314	0.022	0.029
O	9	AR208	0.696	0.567	1.412	-0.739	0.081	-1.030	-0.062	0.062	-5.805	-0.039	0.043
O	10	AR107	0.171	0.264	1.851	2.184	0.134	-8.216	-0.037	0.039	5.787	0.020	0.020
N	11	AR041	0.432	0.567	1.668	0.545	0.140	3.195	0.019	0.031	-3.697	-0.011	0.017
O	12	AR226	0.398	0.550	1.529	0.602	0.096	-0.551	-0.017	0.020	-1.990	-0.011	0.013
O	13	AR172	0.183	0.401	1.902	1.803	0.104	21.713	0.061	0.061	9.768	0.040	0.040
O	14	AR213	0.562	0.568	1.408	-0.082	0.107	5.829	0.030	0.035	2.885	0.026	0.031
O	15	AR071	0.279	0.421	1.539	1.400	0.133	0.246	-0.004	0.006	3.238	0.027	0.027
O	16	AR077	0.330	0.310	2.176	1.543	0.245	3.964	0.010	0.023	-3.585	-0.027	0.027
N	17	AR026	0.310	0.395	1.743	1.429	0.186	0.309	0.012	0.017	4.186	0.025	0.027
O	18	AR154	0.387	0.309	0.875	1.375	0.176	4.294	0.043	0.048	-0.649	0.010	0.019
O	19	AR260	0.274	0.443	1.378	1.329	0.095	0.294	-0.010	0.013	-8.826	-0.054	0.057
N	20	AR018	0.445	0.628	2.014	0.402	0.120	0.781	-0.003	0.017	-0.288	-0.010	0.027
O	21	AR257	0.446	0.474	1.504	0.690	0.190	-4.283	-0.042	0.042	-0.171	-0.000	0.012
O	22	AR194	0.764	0.589	1.558	-0.839	0.189	-0.604	-0.045	0.056	-0.068	0.016	0.016
N	23	AR035	0.568	0.563	1.769	0.164	0.222	-2.371	-0.039	0.050	-2.052	-0.029	0.038
O	24	AR086	0.437	0.569	1.623	0.478	0.116	24.546	0.095	0.095	27.431	0.140	0.140
O	25	AR122	0.493	0.535	1.703	0.453	0.200	-4.174	-0.038	0.045	-1.020	-0.011	0.021
O	26	AR184	0.190	0.371	2.372	1.759	0.121	-0.858	-0.002	0.007	6.720	0.038	0.038
O	27	AR124	0.147	-0.088	0.114	15.528	0.019	1.093	-0.024	0.024	5.994	0.040	0.040
O	28	AR229	0.354	0.424	2.140	1.221	0.223	8.079	0.044	0.062	2.046	0.005	0.016
O	29	AR090	0.186	0.293	3.269	1.883	0.143	-0.484	-0.007	0.007	2.486	0.007	0.022
O	30	AR052	0.569	0.614	2.097	0.135	0.223	6.169	0.052	0.052	1.015	0.000	0.033
O	31	AR160	0.398	0.539	1.830	0.734	0.154	1.600	0.010	0.026	-3.088	-0.035	0.035
O	32	AR151	0.388	0.402	1.700	1.161	0.237	2.098	0.025	0.053	-2.102	-0.027	0.054
O	33	AR197	0.539	0.557	1.767	0.297	0.231	12.059	0.076	0.080	0.161	0.004	0.032
O	34	AR243	0.406	0.586	2.575	0.720	0.192	3.575	0.043	0.043	3.131	0.043	0.043
O	35	AR175	0.487	0.583	1.737	0.287	0.143	-9.249	-0.077	0.077	-18.430	-0.095	0.096
O	36	AR066	0.705	0.567	1.594	-0.472	0.257	2.475	0.018	0.021	-6.366	-0.060	0.065
N	37	AR013	0.648	0.422	0.965	-0.336	0.222	-2.709	-0.064	0.064	-5.439	-0.036	0.039
O	38	AR268	0.232	0.232	1.454	2.274	0.176	-4.213	-0.003	0.003	3.813	0.034	0.034
O	39	AR098	0.335	0.557	2.472	0.966	0.165	4.732	0.031	0.051	6.159	0.055	0.055
O	40	AR199	0.479	0.531	1.872	0.542	0.235	2.416	0.024	0.044	-1.114	-0.013	0.028
O	41	AR246	0.442	0.434	1.691	0.886	0.265	-4.282	-0.043	0.045	-4.025	-0.053	0.071
O	42	AR064	0.251	0.331	1.991	1.703	0.180	7.289	0.042	0.042	3.958	0.035	0.035
O	43	AR244	0.374	0.510	1.773	0.877	0.177	8.295	0.064	0.064	4.185	0.054	0.054
O	44	AR202	0.277	0.459	1.467	1.274	0.112	-0.835	-0.005	0.014	1.023	-0.015	0.043
N	45	AR023	0.525	0.453	1.519	0.446	0.284	1.168	-0.007	0.027	-4.853	-0.052	0.066
O	46	AR134	0.201	0.370	2.024	1.761	0.133	5.712	0.009	0.014	19.850	0.070	0.070
O	47	AR267	0.229	0.281	2.178	1.869	0.183	14.002	0.056	0.056	3.191	0.014	0.021
O	48	AR170	0.141	0.262	3.140	2.070	0.123	5.227	0.015	0.020	-0.609	-0.011	0.012
O	49	AR203	0.248	0.355	1.445	1.655	0.143	7.088	0.013	0.041	2.502	0.011	0.036
O	50	AR223	0.359	0.461	1.691	0.951	0.189	-0.992	-0.032	0.052	-3.271	-0.043	0.075

CAST Arithmetic Reasoning Item Statistics for Combined Form 2

					BILOG			RACE			SEX		
S	Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
O	1	AR265	0.300	0.171	2.062	2.338	0.285	-4.101	-0.015	0.015	-2.445	-0.012	0.046
O	2	AR129	0.377	0.449	1.531	1.033	0.199	24.629	0.102	0.102	26.038	0.113	0.113
O	3	AR214	0.514	0.339	1.056	0.793	0.293	-0.549	-0.018	0.023	1.351	0.023	0.023
O	4	AR091	0.353	0.487	1.736	1.047	0.183	4.969	0.034	0.034	2.802	0.027	0.027
O	5	AR116	0.272	0.412	1.609	1.449	0.153	8.248	0.018	0.020	17.594	0.073	0.076
O	6	AR231	0.314	0.427	1.574	1.300	0.173	3.117	0.027	0.042	10.581	0.054	0.054
O	7	AR268	0.210	0.248	1.426	2.343	0.162	-3.597	-0.027	0.027	4.171	0.007	0.014
O	8	AR180	0.447	0.435	1.060	0.614	0.145	0.709	0.002	0.015	0.178	0.004	0.014
O	9	AR211	0.728	0.493	1.023	-1.033	0.115	1.932	-0.000	0.025	0.731	0.021	0.036
O	10	AR139	0.578	0.446	0.975	-0.133	0.134	1.583	0.001	0.018	-0.388	0.000	0.012
O	11	AR084	0.188	0.257	2.668	2.116	0.163	0.022	-0.002	0.004	9.734	0.033	0.033
N	12	AR030	0.819	0.479	1.053	-1.638	0.107	-1.910	-0.068	0.068	-5.436	-0.055	0.065
N	13	AR017	0.838	0.481	1.019	-1.781	0.137	-0.018	-0.032	0.033	-2.224	-0.044	0.045
O	14	AR204	0.234	0.320	2.255	1.841	0.181	1.716	0.011	0.011	1.019	-0.007	0.013
O	15	AR195	0.686	0.522	1.186	-0.602	0.163	2.772	0.033	0.033	0.581	0.007	0.024
O	16	AR080	0.267	0.342	2.166	1.696	0.198	0.401	0.006	0.020	-0.763	-0.018	0.018
O	17	AR236	0.593	0.433	0.987	-0.300	0.091	-5.926	-0.082	0.082	-11.940	-0.099	0.099
O	18	AR066	0.660	0.582	1.509	-0.456	0.127	0.746	-0.011	0.012	-6.216	-0.065	0.065
O	19	AR186	0.302	0.522	2.443	1.093	0.155	3.512	0.016	0.019	3.361	0.018	0.018
O	20	AR189	0.329	0.281	1.247	1.955	0.237	4.054	0.056	0.056	5.731	0.042	0.042
N	21	AR029	0.564	0.516	1.563	0.205	0.231	-2.589	-0.036	0.041	-1.011	-0.024	0.029
N	22	AR046	0.217	0.431	2.874	1.540	0.138	5.656	0.024	0.030	5.598	0.031	0.037
O	23	AR185	0.291	0.357	1.219	1.547	0.139	-17.956	-0.077	0.077	-1.954	-0.021	0.021
N	24	AR027	0.266	0.300	1.541	1.905	0.187	-2.849	-0.014	0.019	-4.072	-0.040	0.046
O	25	AR168	0.329	0.359	1.788	1.476	0.224	1.649	0.003	0.025	6.019	0.025	0.025
O	26	AR144	0.350	0.485	1.989	0.993	0.174	6.267	0.041	0.041	6.143	0.037	0.037
O	27	AR247	0.312	0.502	2.411	1.149	0.177	7.279	0.045	0.045	10.070	0.053	0.054
O	28	AR128	0.421	0.561	2.422	0.680	0.206	3.124	0.016	0.017	1.056	0.013	0.017
N	29	AR049	0.362	0.537	1.970	0.879	0.162	12.520	0.064	0.064	8.853	0.059	0.063
O	30	AR200	0.341	0.567	2.360	0.866	0.151	0.837	0.001	0.017	6.140	0.048	0.048
O	31	AR112	0.420	0.462	1.619	0.884	0.224	4.030	0.035	0.038	2.048	0.026	0.031
O	32	AR149	0.210	0.527	2.185	1.363	0.088	1.926	0.004	0.009	1.594	0.015	0.025
O	33	AR192	0.312	0.452	1.913	1.244	0.181	-1.569	-0.013	0.017	0.605	-0.003	0.025
O	34	AR099	0.209	0.489	2.337	1.454	0.109	5.931	0.019	0.019	2.306	-0.011	0.031
O	35	AR137	0.693	0.606	2.093	-0.370	0.268	3.660	0.001	0.024	-2.808	-0.022	0.034
O	36	AR220	0.418	0.628	1.901	0.326	0.067	-5.374	-0.062	0.062	-15.308	-0.097	0.097
O	37	AR070	0.270	0.365	2.233	1.580	0.199	3.816	0.017	0.017	10.761	0.052	0.052
O	38	AR242	0.503	0.520	1.997	0.477	0.276	0.670	-0.010	0.022	-1.192	-0.025	0.058
O	39	AR085	0.476	0.521	1.648	0.457	0.210	2.445	0.010	0.035	-1.407	-0.036	0.064
O	40	AR165	0.339	0.454	1.688	1.098	0.183	-6.535	-0.041	0.041	-16.674	-0.094	0.094
N	41	AR041	0.405	0.545	1.699	0.599	0.151	5.600	0.035	0.043	-2.714	-0.028	0.034
O	42	AR196	0.482	0.531	2.114	0.520	0.271	-3.617	-0.038	0.056	0.562	-0.001	0.051
N	43	AR013	0.626	0.440	1.020	-0.426	0.193	-0.726	-0.033	0.033	-11.705	-0.075	0.075
O	44	AR161	0.634	0.536	1.441	-0.393	0.200	-3.614	-0.074	0.074	-10.937	-0.081	0.083
N	45	AR004	0.774	0.478	1.192	-1.369	0.200	-2.817	-0.078	0.078	-11.664	-0.087	0.087
N	46	AR047	0.491	0.563	1.650	0.155	0.154	8.525	0.041	0.041	2.128	0.018	0.027
O	47	AR095	0.229	0.321	1.553	1.932	0.165	1.170	0.019	0.022	16.800	0.077	0.077
O	48	AR182	0.323	0.557	1.786	0.828	0.117	5.681	0.019	0.021	18.025	0.085	0.085
O	49	AR103	0.481	0.485	1.305	0.215	0.151	6.338	0.051	0.056	3.982	0.035	0.053
O	50	AR246	0.415	0.409	1.582	0.965	0.278	1.913	0.003	0.052	0.733	-0.008	0.040

CAST Arithmetic Reasoning Item Statistics for Combined Form 3

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
N	1	AR041	0.407	0.473	1.506	0.750	0.172	6.841	0.047	0.053	7.211	0.043	0.047
O	2	AR270	0.669	0.328	0.973	0.092	0.395	3.236	0.034	0.046	-0.490	-0.011	0.015
O	3	AR120	0.243	0.410	2.218	1.524	0.162	4.670	0.033	0.034	8.734	0.045	0.045
O	4	AR132	0.365	0.410	1.220	0.975	0.143	10.413	0.053	0.054	1.546	0.018	0.018
O	5	AR181	0.501	0.450	1.290	0.358	0.183	-10.555	-0.082	0.082	-13.035	-0.087	0.087
O	6	AR059	0.400	0.530	1.567	0.637	0.132	7.459	0.040	0.044	3.245	0.026	0.026
N	7	AR015	0.352	0.348	1.977	1.352	0.252	-3.108	-0.022	0.022	1.893	-0.003	0.036
O	8	AR074	0.292	0.367	2.221	1.493	0.211	-3.064	-0.006	0.024	8.562	0.044	0.044
N	9	AR042	0.517	0.470	1.594	0.450	0.249	-1.138	-0.014	0.024	-10.439	-0.073	0.078
O	10	AR183	0.323	0.538	1.871	0.965	0.130	2.199	0.018	0.035	20.090	0.066	0.075
O	11	AR096	0.216	0.370	2.752	1.625	0.155	4.927	0.027	0.035	7.581	0.037	0.037
O	12	AR125	0.595	0.625	2.120	-0.029	0.208	4.350	0.037	0.037	2.270	0.026	0.026
N	13	AR016	0.572	0.573	1.678	-0.042	0.152	4.564	0.028	0.028	0.614	0.012	0.015
O	14	AR179	0.455	0.604	2.024	0.328	0.117	3.906	0.003	0.056	9.147	0.067	0.067
O	15	AR127	0.248	0.203	1.826	2.221	0.211	-1.074	-0.007	0.007	7.352	0.049	0.049
O	16	AR066	0.683	0.570	1.569	-0.529	0.141	0.607	-0.029	0.032	-3.009	-0.041	0.047
O	17	AR219	0.494	0.554	1.830	0.368	0.184	8.122	0.025	0.040	7.932	0.063	0.063
O	18	AR138	0.307	0.471	1.870	1.129	0.143	0.173	0.000	0.012	-1.418	-0.025	0.039
O	19	AR239	0.533	0.505	1.346	0.179	0.157	1.773	0.017	0.041	-1.562	-0.014	0.014
O	20	AR148	0.290	0.329	1.533	1.650	0.188	-3.423	-0.014	0.019	3.556	0.012	0.015
O	21	AR110	0.421	0.529	1.968	0.753	0.203	16.688	0.086	0.086	12.311	0.073	0.077
N	22	AR036	0.567	0.560	1.591	0.028	0.164	-4.470	-0.047	0.047	-2.837	-0.022	0.023
O	23	AR111	0.229	0.490	1.532	1.380	0.070	14.675	0.048	0.048	21.792	0.067	0.067
O	24	AR123	0.192	0.425	1.725	1.683	0.089	-12.222	-0.051	0.051	1.681	0.007	0.011
O	25	AR087	0.182	0.251	1.810	2.200	0.136	8.892	0.034	0.034	6.652	0.011	0.017
O	26	AR266	0.332	0.394	1.103	1.186	0.109	1.951	0.023	0.025	9.808	0.057	0.058
O	27	AR102	0.651	0.627	1.689	-0.432	0.108	8.420	0.064	0.064	18.564	0.110	0.110
O	28	AR147	0.434	0.503	1.635	0.686	0.187	-0.589	-0.005	0.037	10.157	0.062	0.062
O	29	AR249	0.314	0.348	1.488	1.518	0.191	-0.561	-0.000	0.007	4.713	0.027	0.029
O	30	AR268	0.222	0.237	1.297	2.383	0.160	-4.232	0.002	0.029	5.157	0.037	0.037
O	31	AR222	0.548	0.552	1.622	0.130	0.186	-6.134	-0.057	0.071	-3.773	-0.034	0.034
O	32	AR164	0.367	0.315	1.130	1.514	0.220	-1.764	-0.013	0.013	-0.794	-0.014	0.024
N	33	AR011	0.784	0.517	1.269	-1.221	0.132	-6.400	-0.115	0.115	-8.744	-0.092	0.092
O	34	AR269	0.672	0.467	1.053	-0.695	0.124	-5.478	-0.086	0.086	-8.859	-0.083	0.083
O	35	AR274	0.439	0.531	1.728	0.585	0.185	1.720	0.015	0.047	0.482	-0.017	0.050
O	36	AR073	0.391	0.444	1.492	0.947	0.196	0.611	0.020	0.038	-2.048	-0.030	0.046
O	37	AR225	0.380	0.433	1.421	0.975	0.181	3.793	0.034	0.034	0.453	0.012	0.025
O	38	AR163	0.288	0.280	1.744	1.793	0.222	-0.552	-0.003	0.008	4.306	0.021	0.048
O	39	AR126	0.506	0.532	1.453	0.153	0.141	6.147	0.038	0.040	-0.172	-0.011	0.014
N	40	AR024	0.561	0.488	1.161	-0.224	0.090	1.286	-0.006	0.034	-9.007	-0.093	0.093
O	41	AR145	0.490	0.534	1.379	0.080	0.090	-1.152	-0.043	0.043	-14.182	-0.105	0.105
O	42	AR055	0.367	0.437	1.586	0.993	0.197	4.655	0.026	0.037	1.777	0.019	0.019
O	43	AR246	0.424	0.384	1.510	0.991	0.270	-6.303	-0.060	0.061	-0.711	-0.021	0.028
O	44	AR191	0.299	0.404	1.970	1.296	0.192	-1.925	-0.012	0.033	-1.287	-0.019	0.034
O	45	AR067	0.555	0.443	1.071	-0.245	0.106	-0.781	-0.030	0.033	-0.393	-0.007	0.008
N	46	AR013	0.588	0.355	0.956	-0.029	0.259	-1.731	-0.034	0.043	-8.638	-0.072	0.076
N	47	AR032	0.243	0.438	1.627	1.345	0.119	-3.401	-0.028	0.028	-0.827	-0.017	0.026
O	48	AR136	0.170	0.306	1.631	2.073	0.119	1.974	0.013	0.013	4.204	0.027	0.027
O	49	AR146	0.418	0.320	1.114	1.025	0.245	-7.787	-0.057	0.060	-6.330	-0.065	0.065
N	50	AR019	0.575	0.344	0.865	-0.254	0.186	7.457	0.042	0.042	-1.811	-0.022	0.047

CAST Arithmetic Reasoning Item Statistics for Combined Form 4

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
N	1	AR022	0.416	0.505	1.587	0.744	0.186	1.497	0.019	0.028	10.775	0.059	0.061
O	2	AR153	0.206	0.198	2.643	2.190	0.200	0.411	0.005	0.010	1.459	-0.002	0.028
O	3	AR065	0.267	0.250	1.594	2.024	0.217	-0.961	0.006	0.021	2.782	0.001	0.033
O	4	AR176	0.271	0.502	1.722	1.192	0.115	-0.109	-0.009	0.012	-3.056	-0.018	0.018
N	5	AR008	0.337	0.275	1.290	1.776	0.245	1.505	0.022	0.022	-2.086	-0.015	0.043
O	6	AR058	0.597	0.414	0.968	-0.144	0.182	0.780	-0.004	0.019	-7.672	-0.073	0.073
O	7	AR068	0.351	0.514	2.238	0.961	0.185	-3.236	-0.003	0.022	2.452	-0.011	0.018
O	8	AR233	0.661	0.558	1.330	-0.589	0.097	-3.327	-0.082	0.083	-6.400	-0.073	0.073
O	9	AR094	0.382	0.483	1.798	0.998	0.208	-6.246	-0.033	0.045	3.809	0.021	0.046
N	10	AR006	0.763	0.531	1.241	-1.057	0.156	-4.102	-0.089	0.090	-1.433	-0.028	0.036
O	11	AR066	0.666	0.553	1.438	-0.438	0.176	0.581	-0.004	0.019	-15.262	-0.118	0.119
O	12	AR152	0.209	0.201	3.128	1.993	0.183	3.261	0.009	0.009	17.439	0.064	0.064
O	13	AR063	0.260	0.313	1.543	1.799	0.177	-8.956	-0.039	0.039	-5.191	-0.040	0.058
O	14	AR246	0.445	0.415	2.021	1.010	0.298	-3.984	-0.031	0.043	-5.076	-0.042	0.059
O	15	AR105	0.576	0.596	1.505	-0.254	0.054	0.254	-0.018	0.018	-0.215	-0.009	0.013
O	16	AR156	0.491	0.593	2.133	0.369	0.190	9.188	0.047	0.047	4.474	0.043	0.043
O	17	AR241	0.501	0.476	1.337	0.414	0.185	-0.952	-0.023	0.023	-5.090	-0.047	0.050
N	18	AR025	0.702	0.625	1.739	-0.660	0.095	1.031	-0.008	0.019	-15.357	-0.090	0.090
O	19	AR167	0.260	0.475	2.383	1.318	0.145	-1.623	-0.006	0.016	4.380	0.017	0.017
O	20	AR114	0.298	0.382	2.442	1.457	0.210	-2.728	-0.026	0.026	8.508	0.010	0.023
O	21	AR255	0.525	0.522	1.764	0.417	0.244	6.298	0.030	0.050	-0.603	0.009	0.017
O	22	AR240	0.510	0.559	1.678	0.296	0.173	4.846	0.042	0.043	2.078	0.031	0.039
O	23	AR258	0.393	0.461	2.175	1.010	0.234	0.926	0.012	0.018	-0.102	-0.008	0.016
O	24	AR115	0.388	0.495	1.653	0.826	0.156	-1.391	-0.020	0.020	-16.561	-0.097	0.097
O	25	AR142	0.341	0.541	1.847	0.914	0.125	5.910	0.018	0.048	6.785	0.039	0.043
O	26	AR166	0.377	0.352	1.423	1.322	0.231	-1.492	-0.015	0.026	-3.320	-0.050	0.050
O	27	AR268	0.228	0.221	1.790	2.189	0.179	-8.009	-0.010	0.025	4.069	0.029	0.029
O	28	AR104	0.588	0.630	1.962	-0.103	0.148	-0.218	-0.035	0.040	-1.984	-0.031	0.034
O	29	AR251	0.280	0.196	2.787	2.020	0.252	-3.557	-0.017	0.018	3.143	0.009	0.011
O	30	AR079	0.228	0.303	1.841	1.909	0.159	-3.133	-0.018	0.019	3.808	0.022	0.022
N	31	AR043	0.435	0.504	1.635	0.676	0.188	8.533	0.056	0.057	3.432	0.025	0.029
N	32	AR013	0.619	0.474	1.109	-0.262	0.167	-2.917	-0.043	0.052	-0.918	-0.003	0.058
O	33	AR118	0.369	0.379	1.430	1.266	0.216	11.934	0.069	0.069	2.842	0.019	0.024
N	34	AR003	0.818	0.530	1.335	-1.343	0.186	-2.816	-0.089	0.093	-7.751	-0.065	0.068
O	35	AR119	0.268	0.383	1.528	1.593	0.151	9.600	0.050	0.050	7.878	0.040	0.040
O	36	AR205	0.202	0.442	1.885	1.621	0.105	-0.936	-0.006	0.022	0.417	-0.015	0.017
O	37	AR057	0.376	0.529	1.877	0.848	0.170	19.233	0.090	0.090	7.343	0.043	0.043
N	38	AR020	0.813	0.483	1.173	-1.486	0.184	-1.708	-0.080	0.088	-5.307	-0.061	0.064
O	39	AR083	0.546	0.507	1.180	-0.119	0.090	0.463	-0.012	0.014	-0.845	-0.020	0.030
O	40	AR253	0.411	0.585	1.518	0.377	0.057	13.792	0.069	0.069	6.675	0.053	0.060
O	41	AR198	0.402	0.571	1.538	0.463	0.082	4.452	0.016	0.025	-0.175	0.002	0.026
O	42	AR061	0.272	0.300	1.809	1.750	0.203	-5.718	-0.019	0.042	8.734	0.047	0.047
N	43	AR041	0.393	0.490	1.541	0.729	0.162	8.905	0.047	0.054	6.223	0.039	0.046
O	44	AR075	0.393	0.500	1.777	0.760	0.187	-1.121	-0.016	0.019	9.107	0.058	0.058
O	45	AR232	0.293	0.439	1.215	1.169	0.094	2.860	0.021	0.023	9.550	0.045	0.051
O	46	AR218	0.398	0.453	1.189	0.638	0.119	-2.842	-0.019	0.021	0.355	0.001	0.015
N	47	AR044	0.308	0.259	1.451	1.838	0.250	1.225	0.016	0.022	6.717	0.032	0.044
O	48	AR082	0.232	0.274	2.603	1.817	0.199	2.102	0.015	0.019	-2.148	-0.030	0.030
O	49	AR262	0.623	0.404	1.098	-0.405	0.233	-0.615	-0.046	0.046	4.913	0.055	0.055
O	50	AR089	0.239	0.388	1.448	1.483	0.123	9.124	0.037	0.037	18.919	0.079	0.080

CAST Arithmetic Reasoning Item Statistics for Combined Form 5

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
O	1	AR109	0.324	0.456	1.552	1.160	0.155	-18.672	-0.074	0.078	-2.887	-0.032	0.042
O	2	AR141	0.417	0.517	1.702	0.723	0.189	7.343	0.044	0.044	1.047	0.020	0.036
O	3	AR187	0.281	0.466	1.920	1.337	0.158	-2.352	-0.017	0.021	9.769	0.057	0.068
O	4	AR081	0.206	0.534	1.886	1.408	0.080	15.781	0.041	0.041	5.142	0.026	0.033
O	5	AR178	0.408	0.490	1.892	0.883	0.224	0.731	-0.001	0.013	3.750	0.036	0.056
N	6	AR014	0.272	0.423	1.851	1.426	0.156	4.020	0.022	0.027	-5.349	-0.042	0.043
O	7	AR133	0.317	0.439	1.678	1.287	0.176	10.283	0.067	0.067	8.988	0.063	0.063
O	8	AR210	0.762	0.456	0.961	-1.258	0.141	-3.374	-0.062	0.063	-10.011	-0.087	0.087
O	9	AR159	0.374	0.528	2.547	0.951	0.212	1.377	0.026	0.026	0.610	0.019	0.022
N	10	AR038	0.318	0.466	2.488	1.233	0.196	-4.343	-0.024	0.024	-1.688	-0.011	0.011
O	11	AR066	0.689	0.563	1.599	-0.230	0.318	0.447	0.007	0.032	-16.835	-0.116	0.117
O	12	AR228	0.493	0.643	2.159	0.301	0.168	3.179	0.032	0.032	-1.081	-0.028	0.029
O	13	AR263	0.334	0.488	2.209	1.112	0.181	2.395	0.031	0.036	-7.671	-0.066	0.066
O	14	AR268	0.233	0.280	1.261	2.104	0.145	-6.533	-0.016	0.023	3.636	0.032	0.032
O	15	AR273	0.573	0.518	1.396	0.156	0.228	2.225	0.024	0.040	5.452	0.048	0.049
N	16	AR031	0.733	0.489	1.078	-0.985	0.124	-4.524	-0.077	0.077	-17.254	-0.128	0.128
O	17	AR221	0.497	0.516	1.651	0.506	0.223	-5.863	-0.055	0.055	-7.669	-0.069	0.074
O	18	AR250	0.359	0.499	2.351	1.040	0.203	-16.710	-0.065	0.065	-10.627	-0.065	0.087
N	19	AR005	0.864	0.535	1.267	-1.727	0.134	-2.428	-0.069	0.069	-1.659	-0.044	0.044
O	20	AR248	0.431	0.375	1.001	0.930	0.174	-0.996	-0.013	0.025	-7.263	-0.065	0.065
O	21	AR230	0.367	0.434	1.902	1.157	0.218	1.351	0.011	0.019	1.084	0.013	0.019
O	22	AR051	0.125	0.440	1.815	2.044	0.056	-0.633	0.001	0.013	3.841	0.011	0.026
O	23	AR215	0.622	0.596	1.594	-0.260	0.142	-2.025	-0.045	0.045	-2.138	-0.038	0.038
N	24	AR048	0.546	0.564	2.211	0.381	0.281	-7.517	-0.060	0.060	-3.780	-0.005	0.040
O	25	AR227	0.475	0.676	2.089	0.172	0.075	0.608	-0.006	0.009	2.556	0.025	0.032
O	26	AR131	0.308	0.472	1.614	1.180	0.129	-5.887	-0.031	0.031	0.750	0.009	0.031
O	27	AR056	0.171	0.417	1.295	1.939	0.057	-10.534	-0.024	0.027	0.632	0.015	0.019
O	28	AR088	0.498	0.591	1.887	0.359	0.187	20.508	0.096	0.103	8.115	0.054	0.054
O	29	AR053	0.493	0.560	1.771	0.396	0.193	3.500	0.025	0.041	4.299	0.035	0.035
O	30	AR100	0.321	0.504	1.566	1.017	0.112	-0.833	-0.008	0.012	0.305	-0.030	0.039
O	31	AR261	0.466	0.569	1.552	0.332	0.113	-0.999	-0.018	0.025	1.251	0.012	0.015
O	32	AR275	0.353	0.587	1.575	0.672	0.059	0.196	-0.009	0.015	3.016	0.026	0.033
O	33	AR135	0.299	0.378	1.811	1.495	0.190	4.253	0.024	0.028	7.268	0.046	0.054
O	34	AR246	0.455	0.462	1.479	0.707	0.217	-1.894	-0.018	0.018	-3.289	-0.034	0.034
O	35	AR252	0.693	0.592	1.451	-0.734	0.099	0.157	-0.026	0.034	-3.947	-0.067	0.067
O	36	AR093	0.252	0.247	2.104	1.991	0.210	1.306	0.016	0.018	2.199	0.000	0.012
N	37	AR001	0.871	0.490	1.250	-1.950	0.161	-0.333	-0.037	0.037	-1.144	-0.043	0.045
N	38	AR009	0.388	0.623	2.238	0.596	0.137	8.451	0.036	0.036	10.983	0.072	0.072
O	39	AR158	0.691	0.549	1.299	-0.827	0.097	0.155	-0.017	0.017	-0.342	-0.022	0.022
O	40	AR072	0.232	0.362	1.513	1.767	0.136	3.254	0.013	0.021	13.265	0.066	0.066
O	41	AR234	0.552	0.573	1.546	-0.078	0.138	8.910	0.059	0.060	-0.490	-0.026	0.026
O	42	AR078	0.240	0.245	1.840	2.108	0.201	4.911	0.041	0.041	9.159	0.032	0.040
O	43	AR171	0.168	0.440	2.192	1.728	0.099	-2.088	-0.018	0.018	4.370	0.013	0.013
N	44	AR013	0.600	0.444	1.001	-0.354	0.158	1.223	-0.004	0.017	-2.086	-0.021	0.051
O	45	AR235	0.570	0.602	2.241	0.067	0.264	2.167	-0.001	0.018	6.235	0.062	0.062
O	46	AR157	0.520	0.513	1.574	0.270	0.237	2.324	0.008	0.013	7.716	0.033	0.064
N	47	AR039	0.458	0.524	2.284	0.601	0.267	5.965	0.039	0.057	4.030	0.024	0.024
O	48	AR259	0.324	0.392	1.919	1.340	0.224	1.365	0.015	0.016	3.877	-0.003	0.057
N	49	AR041	0.424	0.550	1.890	0.537	0.186	15.258	0.079	0.079	10.421	0.059	0.067
O	50	AR060	0.192	0.263	2.059	2.037	0.154	1.244	0.001	0.002	9.165	0.033	0.040

CAST Arithmetic Reasoning Item Statistics for Combined Form 6

					BILOG			RACE			SEX		
S	Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
O	1	AR155	0.227	0.270	2.892	1.906	0.201	2.633	0.012	0.019	4.065	0.014	0.014
O	2	AR209	0.664	0.403	0.805	-0.732	0.145	-0.195	-0.009	0.017	-0.419	-0.017	0.026
O	3	AR190	0.296	0.382	1.648	1.510	0.191	12.681	0.070	0.070	3.234	0.009	0.038
N	4	AR041	0.394	0.459	1.504	0.936	0.196	13.369	0.070	0.070	12.664	0.039	0.061
O	5	AR117	0.296	0.239	1.925	1.962	0.254	3.295	0.029	0.036	0.083	-0.033	0.060
O	6	AR246	0.427	0.399	1.705	1.084	0.281	-0.889	-0.018	0.018	-5.483	-0.051	0.054
O	7	AR106	0.257	0.292	2.399	1.866	0.214	6.575	0.049	0.049	9.157	0.049	0.049
N	8	AR050	0.347	0.511	1.503	0.880	0.114	7.544	0.040	0.040	0.786	-0.005	0.018
O	9	AR121	0.283	0.644	2.053	0.896	0.066	18.388	0.057	0.057	31.660	0.077	0.080
O	10	AR271	0.728	0.583	1.430	-0.761	0.162	0.495	-0.003	0.037	4.081	0.057	0.057
N	11	AR013	0.640	0.412	0.870	-0.403	0.174	-1.407	-0.030	0.030	-8.151	-0.060	0.060
O	12	AR264	0.289	0.441	2.303	1.348	0.178	3.791	0.020	0.037	7.988	0.031	0.041
O	13	AR212	0.706	0.551	1.247	-0.768	0.121	-1.019	-0.038	0.043	-1.132	-0.035	0.035
O	14	AR140	0.361	0.556	2.074	0.848	0.158	6.595	0.024	0.025	9.027	0.056	0.056
N	15	AR034	0.516	0.559	1.630	0.302	0.186	6.243	0.021	0.026	10.019	0.072	0.072
N	16	AR012	0.570	0.504	1.128	-0.168	0.092	-1.509	-0.037	0.037	-2.237	-0.023	0.023
O	17	AR237	0.564	0.599	1.519	-0.133	0.082	-0.109	-0.015	0.025	-6.459	-0.074	0.074
N	18	AR040	0.270	0.483	1.478	1.283	0.091	-0.006	-0.004	0.011	-16.222	-0.069	0.075
O	19	AR054	0.481	0.503	1.543	0.554	0.206	7.530	0.065	0.065	0.699	0.016	0.016
O	20	AR217	0.593	0.558	1.517	-0.064	0.176	1.271	-0.003	0.027	5.276	0.046	0.046
O	21	AR216	0.475	0.566	1.822	0.418	0.169	1.481	-0.011	0.016	3.301	0.032	0.036
O	22	AR076	0.190	0.463	2.403	1.602	0.107	5.065	0.022	0.033	1.374	-0.007	0.027
O	23	AR254	0.724	0.477	1.040	-1.012	0.089	-4.204	-0.063	0.063	-5.420	-0.044	0.046
O	24	AR108	0.376	0.555	2.082	0.815	0.161	-7.652	-0.050	0.050	-8.795	-0.051	0.053
O	25	AR188	0.289	0.523	1.497	1.077	0.073	7.125	0.025	0.036	10.328	0.039	0.039
O	26	AR174	0.385	0.242	1.787	1.800	0.319	-8.729	-0.053	0.055	0.483	0.003	0.032
O	27	AR092	0.389	0.557	1.841	0.728	0.146	0.370	-0.012	0.016	0.909	0.008	0.031
N	28	AR045	0.374	0.496	1.657	0.888	0.158	1.209	0.005	0.009	2.649	0.008	0.028
O	29	AR097	0.341	0.449	1.569	1.128	0.166	4.323	0.011	0.025	7.089	0.046	0.046
O	30	AR245	0.328	0.559	1.590	0.866	0.086	2.812	0.001	0.012	8.348	0.049	0.049
O	31	AR201	0.431	0.588	1.738	0.454	0.119	11.291	0.062	0.062	2.823	0.030	0.040
O	32	AR207	0.163	0.479	2.030	1.724	0.074	6.358	0.024	0.034	9.206	0.017	0.029
O	33	AR238	0.616	0.639	2.135	-0.128	0.204	0.300	-0.017	0.035	2.679	0.017	0.025
O	34	AR130	0.329	0.437	1.903	1.228	0.194	5.513	0.017	0.020	2.996	0.024	0.024
N	35	AR002	0.827	0.535	1.382	-1.497	0.113	-0.579	-0.039	0.044	-3.167	-0.051	0.051
O	36	AR143	0.385	0.570	1.779	0.644	0.119	-10.703	-0.067	0.067	-4.515	-0.037	0.037
N	37	AR037	0.481	0.407	1.023	0.441	0.156	-10.982	-0.088	0.088	-4.319	-0.045	0.045
O	38	AR206	0.209	0.443	1.862	1.596	0.109	-6.485	-0.015	0.015	-0.508	-0.018	0.018
O	39	AR256	0.489	0.563	1.766	0.289	0.172	6.042	0.022	0.025	-1.618	-0.019	0.037
O	40	AR268	0.198	0.258	1.134	2.427	0.126	-0.114	0.013	0.031	13.256	0.055	0.055
O	41	AR177	0.190	0.255	2.172	2.126	0.156	2.247	0.004	0.004	2.121	0.008	0.015
O	42	AR113	0.257	0.339	1.518	1.733	0.167	1.280	0.014	0.014	0.442	0.008	0.008
N	43	AR007	0.716	0.377	0.861	-1.270	0.134	-2.493	-0.061	0.062	-6.330	-0.067	0.067
O	44	AR162	0.511	0.501	1.522	0.255	0.205	1.044	-0.009	0.031	-5.335	-0.061	0.069
O	45	AR272	0.499	0.503	1.614	0.332	0.220	-2.750	-0.035	0.055	-5.336	-0.047	0.069
O	46	AR150	0.303	0.336	1.430	1.576	0.204	2.474	0.023	0.023	13.677	0.071	0.071
O	47	AR169	0.268	0.462	1.329	1.196	0.082	-1.801	-0.017	0.040	-4.784	-0.036	0.036
O	48	AR069	0.445	0.471	1.596	0.585	0.222	2.207	0.026	0.029	5.043	0.037	0.039
O	49	AR066	0.623	0.444	1.362	-0.259	0.266	-1.568	-0.044	0.049	-4.149	-0.043	0.047
O	50	AR062	0.174	0.274	1.487	2.283	0.129	8.581	0.049	0.050	4.216	0.014	0.019

CAST Word Knowledge Item Statistics for Combined Form 1

					BILOG			RACE			SEX		
S	Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
O	1	WK251	0.551	0.618	1.978	0.066	0.128	21.153	0.096	0.097	27.118	0.136	0.136
O	2	WK214	0.450	0.512	2.085	0.610	0.191	-8.885	-0.049	0.049	-2.664	-0.011	0.030
N	3	WK017	0.940	0.614	1.575	-2.278	0.144	-0.572	-0.024	0.024	-3.510	-0.028	0.028
N	4	WK065	0.734	0.580	2.147	-0.340	0.312	-6.030	-0.078	0.079	10.692	0.106	0.106
N	5	WK059	0.961	0.606	1.554	-2.640	0.202	-1.948	-0.048	0.048	-1.050	-0.014	0.014
O	6	WK262	0.899	0.640	1.864	-1.561	0.205	-1.112	-0.030	0.030	0.516	0.024	0.030
N	7	WK006	0.609	0.394	1.051	0.016	0.221	3.617	0.049	0.049	5.246	0.067	0.068
O	8	WK258	0.517	0.501	3.808	0.520	0.288	-0.456	-0.010	0.017	11.057	0.080	0.080
O	9	WK212	0.769	0.428	0.937	-1.300	0.118	7.208	0.086	0.087	35.887	0.204	0.204
N	10	WK062	0.780	0.430	0.923	-1.371	0.131	-3.009	-0.042	0.045	0.026	0.002	0.009
N	11	WK019	0.580	0.359	1.145	0.372	0.280	-2.438	-0.026	0.031	-0.364	-0.004	0.019
O	12	WK199	0.966	0.599	1.472	-2.841	0.172	-1.102	-0.039	0.039	0.027	0.004	0.005
N	13	WK061	0.920	0.574	1.433	-2.095	0.159	-0.843	-0.037	0.037	-2.682	-0.029	0.029
O	14	WK253	0.557	0.539	1.658	0.130	0.165	4.560	0.037	0.039	2.076	0.033	0.038
N	15	WK037	0.466	0.624	2.336	0.379	0.131	5.979	0.028	0.028	-2.262	-0.037	0.047
O	16	WK241	0.852	0.584	1.909	-1.043	0.304	-0.459	-0.021	0.021	-1.588	-0.028	0.032
O	17	WK240	0.915	0.569	1.447	-2.053	0.131	-2.005	-0.057	0.057	-1.622	-0.017	0.017
O	18	WK271	0.959	0.555	1.410	-2.753	0.160	-3.095	-0.057	0.057	-1.943	-0.027	0.027
N	19	WK016	0.881	0.597	1.644	-1.512	0.189	-0.188	-0.015	0.015	0.455	0.029	0.029
N	20	WK102	0.337	0.335	1.609	1.350	0.196	-1.872	-0.011	0.019	0.923	-0.003	0.007
N	21	WK168	0.971	0.567	1.421	-3.070	0.157	-1.240	-0.034	0.034	-0.164	-0.005	0.005
N	22	WK005	0.868	0.541	1.761	-1.073	0.384	0.298	0.012	0.020	0.146	0.012	0.012
N	23	WK115	0.973	0.618	1.597	-2.926	0.163	-0.699	-0.029	0.030	-0.737	-0.010	0.010
N	24	WK141	0.678	0.605	1.892	-0.346	0.175	19.437	0.120	0.120	6.679	0.078	0.078
N	25	WK002	0.385	0.270	1.892	1.422	0.281	-14.686	-0.077	0.077	-51.615	-0.180	0.180
N	26	WK098	0.711	0.681	2.842	-0.371	0.207	57.735	0.197	0.197	1.001	0.015	0.017
N	27	WK099	0.651	0.560	1.542	-0.335	0.137	4.382	0.041	0.042	-0.894	-0.016	0.030
N	28	WK097	0.839	0.428	0.980	-1.672	0.196	-5.841	-0.079	0.079	-4.470	-0.043	0.043
N	29	WK110	0.725	0.480	1.726	-0.213	0.362	-0.023	-0.007	0.016	-3.759	-0.053	0.054
N	30	WK139	0.752	0.438	1.011	-1.071	0.137	1.478	0.038	0.038	2.242	0.046	0.046
N	31	WK136	0.609	0.424	0.975	-0.217	0.137	5.985	0.070	0.070	-5.672	-0.058	0.058
N	32	WK027	0.913	0.663	1.941	-1.664	0.199	-0.682	-0.017	0.020	-3.611	-0.030	0.030
O	33	WK224	0.216	0.299	1.814	1.782	0.134	-19.957	-0.055	0.055	-5.043	-0.031	0.033
N	34	WK143	0.911	0.624	1.597	-1.922	0.115	-0.224	-0.012	0.015	-2.736	-0.025	0.025
N	35	WK032	0.741	0.670	3.009	-0.411	0.260	5.278	0.048	0.048	-0.092	-0.001	0.015
O	36	WK273	0.738	0.552	1.730	-0.526	0.244	2.571	0.035	0.035	32.292	0.154	0.154
N	37	WK171	0.811	0.643	1.963	-0.933	0.203	-0.164	-0.018	0.028	-0.380	0.008	0.009
N	38	WK182	0.928	0.597	1.636	-1.969	0.229	0.141	0.020	0.025	-0.145	0.006	0.010
N	39	WK001	0.400	0.695	3.026	0.480	0.087	3.971	-0.006	0.049	-47.792	-0.145	0.145
N	40	WK127	0.875	0.581	1.527	-1.561	0.173	0.003	-0.003	0.005	-0.258	-0.002	0.017
O	41	WK228	0.816	0.603	1.949	-0.851	0.281	-2.723	-0.055	0.058	-3.698	-0.015	0.021
O	42	WK246	0.956	0.654	1.761	-2.387	0.195	-0.458	-0.024	0.025	-1.867	-0.018	0.018
N	43	WK043	0.904	0.422	0.969	-2.468	0.188	0.002	-0.002	0.016	-1.560	-0.014	0.023
N	44	WK071	0.525	0.548	2.193	0.343	0.209	1.540	0.012	0.047	-12.639	-0.095	0.097
N	45	WK034	0.134	0.216	2.359	2.095	0.099	-6.678	-0.022	0.022	2.291	0.018	0.018
N	46	WK138	0.852	0.452	1.026	-1.768	0.194	-0.723	-0.029	0.033	0.146	0.010	0.016
N	47	WK129	0.630	0.533	1.786	-0.039	0.235	6.004	0.068	0.068	0.229	0.008	0.008
N	48	WK159	0.880	0.718	2.437	-1.293	0.187	4.303	0.055	0.055	-0.963	-0.007	0.010
O	49	WK206	0.827	0.652	1.784	-1.193	0.120	5.461	0.067	0.067	-0.579	0.004	0.010
N	50	WK111	0.637	0.362	1.391	0.355	0.387	-13.743	-0.109	0.112	-19.298	-0.123	0.123

CAST Word Knowledge Item Statistics for Combined Form 2

					BILOG			RACE			SEX		
S Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
N 1	WK119	0.915	0.586	1.593	-1.767	0.261	-0.740	-0.016	0.029	-0.795	-0.014	0.014
O 2	WK221	0.520	0.660	2.093	0.104	0.094	1.497	0.019	0.019	-4.088	0.013	0.056
N 3	WK153	0.563	0.535	2.565	0.315	0.275	10.874	0.085	0.085	0.400	0.020	0.021
O 4	WK265	0.870	0.708	2.722	-1.062	0.244	1.129	0.025	0.025	-0.449	-0.001	0.005
O 5	WK212	0.765	0.441	1.005	-1.243	0.093	9.562	0.101	0.101	37.431	0.220	0.220
O 6	WK267	0.682	0.581	2.634	-0.125	0.297	18.386	0.106	0.106	6.521	0.058	0.058
N 7	WK150	0.920	0.616	2.415	-1.310	0.402	0.045	0.007	0.008	0.070	0.012	0.012
N 8	WK009	0.868	0.507	1.183	-1.791	0.138	-2.065	-0.030	0.030	-3.812	-0.047	0.047
O 9	WK275	0.859	0.607	1.823	-1.217	0.219	4.672	0.081	0.081	1.217	0.038	0.054
O 10	WK218	0.563	0.566	2.854	0.244	0.245	-0.721	-0.010	0.021	-0.215	-0.002	0.031
N 11	WK129	0.607	0.525	1.808	0.038	0.225	4.297	0.038	0.038	-2.472	-0.013	0.028
N 12	WK091	0.582	0.517	1.306	-0.089	0.120	3.746	0.054	0.054	-4.482	-0.037	0.037
N 13	WK173	0.524	0.307	1.721	0.997	0.374	-9.372	-0.070	0.080	-5.901	-0.016	0.050
N 14	WK110	0.726	0.503	1.374	-0.611	0.202	-2.171	-0.046	0.055	-4.231	-0.057	0.057
O 15	WK200	0.832	0.543	1.559	-1.109	0.230	2.959	0.054	0.054	0.767	0.035	0.036
N 16	WK045	0.877	0.623	1.796	-1.418	0.159	3.687	0.072	0.072	3.202	0.056	0.056
N 17	WK120	0.657	0.515	1.533	-0.246	0.198	1.558	0.007	0.052	-0.528	0.015	0.029
N 18	WK176	0.959	0.480	1.203	-3.037	0.162	-1.571	-0.033	0.033	-0.275	-0.005	0.005
N 19	WK013	0.505	0.276	1.583	1.195	0.375	-7.087	-0.050	0.057	-5.451	-0.051	0.070
O 20	WK259	0.849	0.524	1.428	-1.366	0.181	-0.377	-0.021	0.021	1.234	0.042	0.042
N 21	WK041	0.947	0.692	1.924	-2.134	0.114	-0.443	-0.011	0.030	-0.144	0.002	0.002
N 22	WK047	0.605	0.272	0.640	-0.038	0.200	-20.460	-0.130	0.130	-8.904	-0.094	0.094
N 23	WK020	0.445	0.051	2.587	2.108	0.422	-7.101	-0.062	0.062	0.147	-0.007	0.026
N 24	WK160	0.929	0.552	1.376	-2.306	0.102	-0.915	-0.031	0.031	-0.278	0.007	0.009
N 25	WK152	0.826	0.663	2.255	-0.940	0.190	-1.508	-0.036	0.036	-1.863	-0.025	0.025
N 26	WK114	0.736	0.558	1.610	-0.665	0.161	-3.730	-0.053	0.054	0.611	0.017	0.026
N 27	WK137	0.948	0.775	2.575	-1.892	0.110	-0.205	-0.002	0.009	-0.185	0.001	0.001
N 28	WK067	0.933	0.571	1.572	-2.043	0.220	-0.984	-0.035	0.035	-0.033	0.010	0.010
N 29	WK049	0.880	0.632	2.048	-1.296	0.209	-1.810	-0.046	0.048	0.078	0.015	0.015
N 30	WK012	0.926	0.531	1.356	-2.266	0.125	-1.886	-0.052	0.052	-0.052	0.005	0.005
N 31	WK060	0.754	0.621	2.289	-0.548	0.229	1.255	0.001	0.030	5.081	0.064	0.064
O 32	WK204	0.792	0.547	1.563	-0.902	0.208	-4.292	-0.062	0.063	-4.354	-0.033	0.037
N 33	WK070	0.412	0.338	1.178	1.112	0.203	-1.476	0.001	0.020	-5.945	-0.054	0.055
O 34	WK262	0.879	0.628	1.776	-1.500	0.111	0.104	0.026	0.029	1.019	0.037	0.037
O 35	WK233	0.364	0.487	2.228	0.894	0.168	-19.171	-0.066	0.068	-45.260	-0.166	0.166
N 36	WK054	0.835	0.542	1.305	-1.480	0.090	1.997	0.061	0.069	0.661	0.030	0.030
N 37	WK066	0.956	0.546	1.464	-2.534	0.265	-0.298	-0.005	0.011	-0.285	-0.007	0.007
O 38	WK227	0.809	0.700	2.623	-0.840	0.168	3.645	0.058	0.058	3.749	0.052	0.053
N 39	WK190	0.865	0.614	1.718	-1.416	0.132	-0.121	0.000	0.008	0.188	0.023	0.024
N 40	WK165	0.917	0.634	2.050	-1.551	0.285	0.602	0.047	0.047	-0.058	0.008	0.009
N 41	WK064	0.712	0.547	1.531	-0.557	0.175	-0.250	-0.017	0.030	-0.931	0.002	0.025
N 42	WK074	0.669	0.626	2.018	-0.343	0.152	-8.843	-0.057	0.081	-13.065	-0.086	0.086
N 43	WK147	0.506	0.378	0.836	0.345	0.123	0.953	0.018	0.022	2.188	0.031	0.049
N 44	WK042	0.686	0.413	1.167	-0.217	0.303	-1.513	-0.008	0.013	-14.835	-0.112	0.112
N 45	WK081	0.315	0.434	2.301	1.138	0.167	1.250	0.010	0.017	-1.722	-0.010	0.025
O 46	WK239	0.693	0.586	1.805	-0.425	0.182	7.847	0.068	0.068	8.332	0.074	0.075
N 47	WK100	0.925	0.649	1.841	-1.896	0.192	-0.921	-0.014	0.014	-0.595	-0.001	0.009
N 48	WK001	0.413	0.669	3.463	0.480	0.124	1.257	0.003	0.028	-13.733	-0.082	0.082
N 49	WK149	0.848	0.605	2.095	-1.012	0.296	1.420	0.006	0.034	-0.427	-0.007	0.007
O 50	WK274	0.710	0.642	2.448	-0.403	0.215	2.717	0.022	0.028	0.337	0.016	0.016

CAST Word Knowledge Item Statistics for Combined Form 3

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
N	1	WK055	0.554	0.468	2.011	0.433	0.290	-7.379	-0.072	0.072	2.812	0.004	0.065
N	2	WK029	0.512	0.260	1.782	1.199	0.397	-26.047	-0.122	0.122	-2.912	-0.019	0.028
O	3	WK215	0.186	0.465	2.324	1.495	0.088	3.335	0.008	0.018	-1.581	0.001	0.039
N	4	WK148	0.533	0.473	1.204	0.171	0.137	21.841	0.125	0.126	3.398	0.044	0.044
N	5	WK084	0.736	0.604	2.289	-0.379	0.298	-1.173	-0.038	0.045	-2.489	-0.028	0.031
N	6	WK154	0.897	0.452	1.081	-2.176	0.186	-0.077	-0.014	0.016	-0.794	-0.014	0.014
O	7	WK268	0.963	0.556	1.393	-2.812	0.231	-1.021	-0.048	0.048	-1.684	-0.025	0.025
N	8	WK011	0.463	0.441	1.459	0.665	0.198	2.625	0.036	0.055	7.607	0.059	0.059
N	9	WK001	0.401	0.698	3.761	0.509	0.117	-0.301	-0.001	0.027	-40.540	-0.128	0.137
N	10	WK051	0.815	0.595	2.305	-0.668	0.357	1.100	0.009	0.032	-1.617	-0.016	0.031
O	11	WK217	0.669	0.523	1.222	-0.567	0.100	5.502	0.072	0.072	-7.900	-0.030	0.039
N	12	WK080	0.783	0.413	0.970	-1.252	0.181	-3.553	-0.068	0.068	3.122	0.071	0.071
O	13	WK201	0.939	0.609	1.502	-2.290	0.168	0.119	0.001	0.006	-0.195	-0.001	0.009
N	14	WK164	0.855	0.447	0.994	-1.920	0.135	0.148	-0.012	0.020	-0.449	-0.002	0.002
N	15	WK162	0.950	0.490	1.123	-2.973	0.166	0.019	-0.016	0.016	-0.090	-0.009	0.009
O	16	WK212	0.764	0.448	1.026	-1.129	0.148	11.718	0.110	0.110	24.504	0.189	0.189
N	17	WK187	0.856	0.530	1.507	-1.304	0.253	2.235	0.028	0.051	2.242	0.049	0.049
O	18	WK272	0.926	0.662	1.969	-1.785	0.209	-1.606	-0.073	0.073	-2.187	-0.027	0.031
N	19	WK169	0.490	0.437	1.070	0.362	0.117	-17.767	-0.096	0.101	.	-0.318	0.318
O	20	WK213	0.553	0.594	2.326	0.187	0.199	13.197	0.073	0.073	-0.717	-0.020	0.034
O	21	WK261	0.933	0.633	1.874	-1.817	0.285	1.008	0.027	0.027	0.080	0.010	0.011
N	22	WK039	0.466	0.441	2.857	0.785	0.289	-0.137	0.001	0.009	-2.121	-0.005	0.063
O	23	WK255	0.574	0.487	1.267	0.017	0.151	4.087	0.039	0.039	-4.423	-0.037	0.046
N	24	WK079	0.961	0.646	1.746	-2.518	0.154	-0.083	-0.026	0.027	-0.707	-0.012	0.013
N	25	WK118	0.801	0.534	1.691	-0.810	0.285	-1.388	-0.036	0.057	1.853	0.050	0.050
N	26	WK057	0.894	0.555	1.375	-1.862	0.152	0.985	0.014	0.026	0.311	0.024	0.024
O	27	WK248	0.780	0.514	1.560	-0.767	0.259	-1.010	-0.035	0.035	2.052	0.045	0.045
N	28	WK116	0.665	0.573	1.746	-0.312	0.177	-0.400	-0.010	0.015	2.577	0.032	0.042
N	29	WK025	0.738	0.639	1.900	-0.664	0.140	18.485	0.093	0.097	1.852	0.043	0.043
N	30	WK072	0.944	0.584	1.559	-2.320	0.168	0.145	-0.001	0.017	0.410	0.025	0.025
O	31	WK247	0.549	0.529	1.617	0.174	0.175	0.582	0.013	0.024	1.395	0.034	0.034
O	32	WK211	0.811	0.638	2.009	-0.904	0.212	1.426	0.011	0.012	0.932	0.033	0.033
N	33	WK163	0.707	0.454	1.211	-0.469	0.247	-8.699	-0.094	0.094	-22.344	-0.144	0.144
N	34	WK018	0.846	0.619	1.786	-1.223	0.185	5.081	0.066	0.066	-0.263	0.007	0.009
N	35	WK048	0.657	0.602	1.741	-0.329	0.152	-8.161	-0.080	0.080	-2.573	-0.033	0.036
N	36	WK151	0.813	0.654	2.154	-0.903	0.205	30.087	0.169	0.170	42.961	0.200	0.200
O	37	WK262	0.903	0.592	1.756	-1.565	0.285	0.168	0.000	0.001	0.857	0.043	0.043
N	38	WK077	0.913	0.574	1.402	-2.046	0.186	-0.060	-0.025	0.025	-1.009	-0.025	0.026
N	39	WK178	0.912	0.542	1.266	-2.209	0.154	0.067	-0.003	0.007	-0.413	-0.016	0.016
N	40	WK110	0.715	0.511	1.655	-0.318	0.308	-2.076	-0.023	0.031	-4.419	-0.055	0.058
N	41	WK129	0.617	0.568	2.039	0.018	0.241	18.390	0.102	0.102	-0.597	-0.016	0.025
O	42	WK243	0.825	0.509	1.126	-1.595	0.097	1.497	0.028	0.028	-2.078	0.005	0.016
N	43	WK104	0.433	0.596	2.739	0.539	0.164	-2.731	-0.023	0.036	5.347	0.052	0.052
N	44	WK082	0.792	0.586	1.781	-0.791	0.273	-4.574	-0.052	0.055	-0.088	0.005	0.009
O	45	WK231	0.416	0.584	2.343	0.595	0.152	-1.418	-0.016	0.030	9.996	0.087	0.087
N	46	WK126	0.926	0.579	1.399	-2.283	0.212	-0.206	-0.029	0.031	-2.130	-0.025	0.026
N	47	WK195	0.273	0.265	2.551	1.636	0.212	-3.415	-0.008	0.022	-10.808	-0.047	0.081
N	48	WK181	0.941	0.564	1.308	-2.825	0.133	-0.036	-0.015	0.016	-0.946	-0.011	0.012
N	49	WK050	0.939	0.570	1.324	-2.770	0.165	-0.081	-0.012	0.012	-1.268	-0.020	0.020
N	50	WK107	0.942	0.539	1.283	-2.914	0.170	-0.002	-0.002	0.007	-0.243	0.001	0.001

CAST Word Knowledge Item Statistics for Combined Form 4

					BILOG			RACE			SEX		
S	Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
O	1	WK208	0.913	0.519	1.683	-1.753	0.200	0.732	0.030	0.030	-0.991	-0.010	0.014
N	2	WK010	0.463	0.512	1.469	0.641	0.200	-2.729	-0.025	0.038	-1.886	-0.046	0.063
O	3	WK245	0.885	0.585	2.100	-1.347	0.200	-0.351	-0.024	0.025	5.769	0.054	0.054
N	4	WK108	0.766	0.541	1.716	-0.733	0.200	-3.249	-0.050	0.054	-12.457	-0.093	0.093
N	5	WK001	0.424	0.710	3.405	0.619	0.200	2.926	0.001	0.027	-41.274	-0.172	0.209
N	6	WK021	0.909	0.491	1.513	-1.813	0.200	-0.048	-0.010	0.010	-1.163	-0.019	0.019
O	7	WK207	0.355	0.521	1.546	1.250	0.200	4.997	0.044	0.044	1.760	0.016	0.054
O	8	WK269	0.914	0.575	2.126	-1.597	0.200	0.490	0.018	0.023	-3.062	-0.019	0.036
N	9	WK073	0.461	0.507	1.430	0.661	0.200	-3.504	-0.025	0.038	-10.383	-0.061	0.061
N	10	WK088	0.654	0.549	1.766	-0.223	0.200	1.697	0.008	0.032	2.966	0.026	0.049
O	11	WK219	0.706	0.636	2.489	-0.389	0.200	-1.204	-0.029	0.040	1.580	0.011	0.018
O	12	WK262	0.900	0.627	2.535	-1.375	0.200	1.173	0.018	0.018	1.240	0.039	0.045
N	13	WK167	0.961	0.657	3.473	-1.773	0.200	-1.334	-0.044	0.045	-0.712	0.001	0.026
N	14	WK093	0.602	0.310	0.750	-0.012	0.200	-0.076	0.012	0.026	-1.160	0.002	0.003
N	15	WK083	0.730	0.581	1.989	-0.522	0.200	-8.183	-0.099	0.099	-1.480	-0.016	0.021
N	16	WK092	0.520	0.551	1.682	0.341	0.200	-8.804	-0.055	0.071	-0.397	-0.012	0.035
O	17	WK212	0.774	0.456	1.273	-0.913	0.200	16.250	0.135	0.135	53.782	0.239	0.239
N	18	WK004	0.962	0.641	2.863	-1.852	0.200	-0.076	-0.021	0.021	-1.232	-0.013	0.018
N	19	WK166	0.879	0.473	1.344	-1.633	0.200	0.287	0.012	0.035	-1.598	-0.029	0.030
O	20	WK216	0.657	0.649	2.637	-0.200	0.200	-4.872	-0.053	0.061	-3.163	-0.050	0.057
O	21	WK250	0.784	0.554	1.816	-0.801	0.200	-6.442	-0.085	0.094	0.590	0.014	0.018
N	22	WK131	0.942	0.669	4.946	-1.590	0.200	0.813	0.026	0.026	-0.553	0.012	0.030
N	23	WK033	0.912	0.717	5.172	-1.294	0.200	5.112	0.061	0.061	0.965	0.048	0.052
O	24	WK266	0.916	0.646	2.938	-1.456	0.200	-0.441	-0.031	0.036	-1.119	-0.011	0.016
N	25	WK179	0.903	0.550	1.823	-1.589	0.200	-0.024	-0.016	0.017	-0.040	0.003	0.003
O	26	WK198	0.886	0.530	1.644	-1.524	0.200	-3.231	-0.056	0.058	-5.529	-0.037	0.042
N	27	WK132	0.712	0.679	3.180	-0.384	0.200	7.217	0.066	0.066	3.400	0.026	0.026
N	28	WK174	0.596	0.267	0.617	0.034	0.200	-1.168	-0.026	0.031	15.654	0.107	0.109
N	29	WK068	0.721	0.554	1.746	-0.515	0.200	5.955	0.070	0.070	-1.714	-0.039	0.040
O	30	WK236	0.217	0.458	1.909	2.133	0.200	0.324	0.000	0.016	4.827	0.046	0.086
N	31	WK197	0.522	0.581	1.846	0.311	0.200	-4.078	-0.018	0.046	-2.700	-0.046	0.049
O	32	WK256	0.549	0.649	2.529	0.176	0.200	2.428	-0.005	0.046	-2.121	-0.054	0.063
N	33	WK040	0.818	0.643	2.495	-0.882	0.200	4.822	0.049	0.049	3.874	0.062	0.063
N	34	WK188	0.846	0.646	2.474	-1.040	0.200	2.155	0.039	0.039	-3.064	-0.006	0.034
N	35	WK133	0.659	0.682	3.111	-0.209	0.200	-9.057	-0.060	0.096	-7.953	-0.077	0.085
N	36	WK078	0.714	0.378	0.907	-0.752	0.200	-0.192	-0.029	0.040	0.172	0.006	0.008
N	37	WK183	0.951	0.587	2.048	-2.070	0.200	0.277	0.000	0.000	-0.408	-0.002	0.002
N	38	WK110	0.743	0.489	1.334	-0.737	0.200	-0.316	-0.017	0.018	-10.358	-0.095	0.095
O	39	WK237	0.940	0.614	2.476	-1.880	0.200	-0.113	-0.021	0.021	-1.797	-0.006	0.022
N	40	WK076	0.858	0.654	2.446	-1.134	0.200	3.611	0.049	0.049	-3.653	-0.021	0.023
N	41	WK129	0.615	0.529	1.529	-0.085	0.200	4.776	0.028	0.041	-9.772	-0.068	0.068
N	42	WK035	0.037	0.113	0.132	20.570	0.200	3.928	0.004	0.005	12.873	0.232	0.232
N	43	WK186	0.747	0.368	0.848	-1.076	0.200	0.613	0.011	0.012	-5.042	-0.078	0.079
N	44	WK090	0.618	0.482	1.278	-0.125	0.200	3.252	0.047	0.047	3.282	0.030	0.033
N	45	WK086	0.781	0.722	3.930	-0.667	0.200	0.059	-0.011	0.014	-0.563	-0.000	0.033
N	46	WK157	0.869	0.534	1.446	-1.589	0.200	0.259	0.002	0.005	-9.710	-0.044	0.044
N	47	WK096	0.864	0.690	3.026	-1.155	0.200	6.330	0.070	0.070	5.137	0.080	0.080
O	48	WK257	0.557	0.612	2.030	0.127	0.200	8.254	0.026	0.035	-2.736	-0.051	0.058
N	49	WK105	0.903	0.527	1.438	-1.985	0.200	0.321	0.002	0.017	-0.204	0.007	0.011
N	50	WK063	0.331	0.463	1.202	1.577	0.200	6.668	0.048	0.048	2.826	0.021	0.060

CAST Word Knowledge Item Statistics for Combined Form 5

S	Pos	Num	PctCor	Bis	BILOG a	BILOG b	BILOG c	RACE chi-sq	RACE ICCS	RACE ICCA	SEX chi-sq	SEX ICCS	SEX ICCA
N	1	WK087	0.953	0.613	1.807	-2.211	0.251	-2.330	-0.054	0.054	-2.507	-0.020	0.021
N	2	WK135	0.793	0.523	1.540	-0.839	0.266	-4.456	-0.078	0.085	0.044	0.019	0.038
O	3	WK238	0.935	0.625	1.703	-2.023	0.213	-1.516	-0.035	0.035	-1.830	-0.022	0.022
O	4	WK222	0.210	0.594	3.281	1.148	0.077	-9.937	-0.044	0.044	-4.879	-0.019	0.043
N	5	WK110	0.726	0.489	1.312	-0.603	0.225	0.179	0.006	0.018	-9.971	-0.072	0.072
N	6	WK003	0.408	0.473	1.415	0.727	0.136	-1.036	-0.011	0.032	39.871	0.164	0.164
N	7	WK129	0.610	0.525	1.937	0.090	0.257	16.835	0.074	0.074	-1.607	-0.001	0.016
N	8	WK161	0.879	0.577	1.509	-1.596	0.169	-2.058	-0.031	0.050	-0.597	-0.000	0.004
N	9	WK140	0.658	0.373	0.843	-0.415	0.195	-5.675	-0.060	0.060	-6.854	-0.049	0.050
N	10	WK128	0.430	0.433	2.102	0.862	0.242	-2.490	-0.012	0.032	-11.126	-0.067	0.067
N	11	WK007	0.768	0.485	1.198	-1.000	0.167	-3.287	-0.065	0.065	-3.858	-0.044	0.044
N	12	WK117	0.687	0.482	1.244	-0.463	0.193	2.227	0.026	0.047	-0.811	-0.008	0.009
N	13	WK106	0.946	0.615	1.541	-2.411	0.114	-1.756	-0.053	0.053	-1.172	-0.021	0.021
O	14	WK262	0.904	0.618	1.967	-1.517	0.229	0.421	0.020	0.022	0.548	0.027	0.030
N	15	WK196	0.929	0.552	1.704	-1.758	0.339	-3.952	-0.080	0.080	-3.980	-0.039	0.040
O	16	WK212	0.752	0.403	1.096	-0.769	0.257	6.270	0.089	0.089	40.384	0.213	0.213
N	17	WK109	0.963	0.602	1.619	-2.635	0.177	-1.691	-0.040	0.040	-0.262	-0.007	0.007
N	18	WK001	0.411	0.663	3.915	0.457	0.116	4.540	0.006	0.048	-34.045	-0.116	0.116
N	19	WK124	0.927	0.571	1.587	-1.948	0.231	-1.521	-0.033	0.033	-1.451	-0.015	0.015
O	20	WK230	0.741	0.616	2.009	-0.578	0.194	3.602	0.036	0.036	-3.220	-0.042	0.042
N	21	WK058	0.902	0.522	1.254	-2.074	0.130	-1.727	-0.038	0.038	-0.803	-0.014	0.014
N	22	WK046	0.744	0.517	1.492	-0.686	0.201	9.462	0.090	0.091	23.049	0.157	0.159
N	23	WK101	0.857	0.662	2.056	-1.224	0.145	14.601	0.126	0.126	1.886	0.044	0.045
O	24	WK225	0.933	0.732	2.327	-1.758	0.158	-1.913	-0.049	0.050	-1.556	-0.017	0.017
O	25	WK254	0.602	0.572	2.028	0.010	0.202	4.571	0.030	0.068	5.343	0.052	0.052
N	26	WK008	0.826	0.533	1.559	-1.021	0.269	-4.491	-0.076	0.076	0.064	0.011	0.019
N	27	WK194	0.633	0.514	2.046	0.092	0.299	-3.761	-0.045	0.063	-1.621	-0.021	0.023
N	28	WK142	0.584	0.435	1.517	0.273	0.271	-13.156	-0.098	0.104	-2.882	-0.035	0.036
O	29	WK260	0.958	0.683	2.184	-2.139	0.195	-0.611	-0.022	0.022	-0.210	0.001	0.003
N	30	WK184	0.802	0.454	1.347	-0.893	0.300	25.255	0.169	0.169	12.185	0.104	0.105
O	31	WK226	0.904	0.569	1.414	-1.931	0.145	-2.851	-0.043	0.044	0.022	0.015	0.019
N	32	WK089	0.939	0.677	2.235	-1.767	0.252	0.567	0.030	0.035	0.680	0.022	0.023
O	33	WK229	0.802	0.640	2.073	-0.873	0.183	8.882	0.083	0.084	5.326	0.062	0.062
O	34	WK252	0.950	0.631	1.707	-2.374	0.108	-0.972	-0.041	0.041	-2.106	-0.022	0.022
N	35	WK156	0.569	0.396	0.990	0.109	0.176	4.308	0.036	0.036	5.802	0.020	0.066
O	36	WK234	0.516	0.500	1.864	0.430	0.226	-7.117	-0.063	0.063	-0.864	-0.021	0.037
N	37	WK014	0.427	0.525	2.328	0.638	0.181	5.819	0.026	0.047	-4.943	-0.061	0.062
O	38	WK210	0.738	0.571	1.771	-0.583	0.207	39.064	0.194	0.194	-4.870	-0.044	0.044
N	39	WK053	0.954	0.574	1.757	-2.175	0.312	-0.091	-0.004	0.007	-1.114	-0.022	0.022
N	40	WK022	0.184	0.253	3.429	1.754	0.139	-7.878	-0.052	0.052	-13.7[illegible]7	-0.049	0.049
N	41	WK075	0.769	0.420	0.985	-1.096	0.200	-4.349	-0.064	0.064	-9.584	-0.093	0.093
N	42	WK121	0.638	0.461	2.058	0.215	0.361	-1.610	-0.032	0.032	2.930	0.048	0.048
N	43	WK030	0.599	0.515	1.679	0.105	0.244	-10.146	-0.088	0.088	-6.384	-0.046	0.047
N	44	WK134	0.889	0.653	2.354	-1.198	0.331	3.983	0.069	0.069	0.189	0.026	0.026
N	45	WK085	0.878	0.576	1.954	-1.179	0.357	1.460	0.034	0.034	0.054	0.016	0.016
N	46	WK038	0.316	0.311	2.104	1.529	0.230	3.599	0.031	0.061	-11.609	-0.063	0.082
N	47	WK024	0.916	0.681	2.051	-1.681	0.220	0.501	0.028	0.028	2.168	0.059	0.059
N	48	WK191	0.965	0.645	1.705	-2.847	0.207	-0.019	-0.001	0.001	-1.316	-0.007	0.007
O	49	WK205	0.880	0.663	2.170	-1.287	0.253	5.388	0.089	0.089	0.533	0.035	0.035
N	50	WK112	0.826	0.512	1.286	-1.266	0.248	-0.099	-0.007	0.012	-4.586	-0.049	0.049

CAST Word Knowledge Item Statistics for Combined Form 6

					BILOG			RACE			SEX		
S	Pos	Num	PctCor	Bis	a	b	c	chi-sq	ICCS	ICCA	chi-sq	ICCS	ICCA
N	1	WK036	0.938	0.586	1.449	-2.359	0.168	-0.906	-0.036	0.036	-3.250	-0.027	0.027
O	2	WK232	0.664	0.609	3.166	-0.004	0.324	25.499	0.115	0.115	13.573	0.083	0.083
N	3	WK052	0.806	0.488	1.107	-1.349	0.164	-2.560	-0.056	0.056	-6.726	-0.053	0.053
O	4	WK202	0.638	0.535	1.627	-0.111	0.230	2.154	0.024	0.025	-6.550	-0.048	0.048
N	5	WK145	0.956	0.617	1.534	-2.650	0.117	-2.040	-0.049	0.049	-1.815	-0.017	0.018
N	6	WK172	0.659	0.543	1.445	-0.352	0.163	1.253	0.020	0.032	-3.960	-0.052	0.068
N	7	WK028	0.947	0.629	1.574	-2.353	0.186	0.376	0.020	0.021	-0.129	0.014	0.014
O	8	WK212	0.754	0.457	1.078	-1.007	0.163	13.111	0.127	0.127	37.285	0.206	0.206
O	9	WK242	0.904	0.612	1.613	-1.835	0.130	0.535	0.018	0.032	1.098	0.047	0.047
O	10	WK223	0.274	0.565	2.229	1.051	0.094	7.099	0.048	0.048	13.627	0.076	0.076
N	11	WK031	0.379	0.615	2.873	0.635	0.126	8.975	0.052	0.054	34.452	0.124	0.124
N	12	WK001	0.437	0.679	3.208	0.412	0.124	1.207	0.001	0.043	-68.823	-0.181	0.181
N	13	WK185	0.885	0.590	1.533	-1.668	0.149	3.371	0.071	0.072	0.816	0.036	0.036
N	14	WK110	0.744	0.444	1.224	-0.559	0.306	0.209	0.005	0.015	-9.024	-0.087	0.088
O	15	WK244	0.919	0.656	1.833	-1.836	0.145	-0.922	-0.034	0.034	-0.625	0.011	0.011
O	16	WK264	0.795	0.588	1.822	-0.812	0.247	2.272	0.041	0.041	2.695	0.049	0.051
O	17	WK263	0.928	0.711	2.203	-1.814	0.121	-0.152	-0.006	0.011	-7.381	-0.033	0.033
N	18	WK180	0.943	0.540	1.368	-2.503	0.146	-0.513	-0.021	0.021	-1.261	-0.009	0.009
N	19	WK129	0.642	0.508	1.794	0.017	0.286	1.223	0.023	0.023	-12.046	-0.082	0.082
N	20	WK095	0.829	0.658	2.022	-1.019	0.202	10.371	0.091	0.093	0.669	0.031	0.031
N	21	WK155	0.337	0.274	3.366	1.277	0.243	-26.395	-0.087	0.087	-2.904	-0.016	0.016
O	22	WK249	0.580	0.488	1.226	-0.068	0.129	2.655	0.050	0.052	-0.692	-0.004	0.014
N	23	WK175	0.947	0.521	1.276	-2.708	0.127	-1.142	-0.038	0.039	-3.619	-0.034	0.034
N	24	WK146	0.917	0.659	1.751	-1.861	0.133	-0.321	-0.010	0.034	-1.025	-0.002	0.017
O	25	WK235	0.456	0.650	3.247	0.398	0.146	-1.177	-0.003	0.039	41.252	0.128	0.129
N	26	WK103	0.910	0.454	1.024	-2.517	0.120	-2.440	-0.049	0.049	-4.699	-0.038	0.038
O	27	WK203	0.854	0.538	1.357	-1.469	0.185	-9.168	-0.103	0.107	-5.034	-0.044	0.044
N	28	WK015	0.677	0.600	2.018	-0.264	0.222	-0.886	-0.016	0.016	16.438	0.118	0.118
N	29	WK158	0.844	0.675	2.261	-1.032	0.223	-0.993	-0.037	0.042	-13.935	-0.064	0.064
N	30	WK189	0.890	0.504	1.187	-2.014	0.145	-1.231	-0.035	0.035	-6.940	-0.043	0.043
N	31	WK113	0.809	0.717	2.685	-0.824	0.194	6.001	0.071	0.073	-1.149	0.006	0.012
N	32	WK177	0.453	0.580	2.443	0.484	0.165	-0.124	-0.003	0.016	15.822	0.105	0.105
N	33	WK069	0.866	0.389	0.867	-2.251	0.132	0.299	-0.003	0.003	1.918	0.062	0.062
N	34	WK123	0.849	0.433	0.937	-2.009	0.101	-6.897	-0.085	0.085	-3.664	-0.022	0.022
N	35	WK125	0.501	0.484	1.583	0.437	0.192	-14.271	-0.087	0.087	-12.561	-0.084	0.084
O	36	WK209	0.684	0.728	3.035	-0.345	0.158	12.000	0.055	0.060	0.397	-0.007	0.042
O	37	WK220	0.226	0.559	2.196	1.187	0.066	34.988	0.087	0.087	12.079	0.041	0.041
N	38	WK023	0.479	0.355	2.271	0.974	0.335	-14.054	-0.076	0.079	-0.699	-0.005	0.005
O	39	WK270	0.952	0.625	1.577	-2.511	0.135	-2.672	-0.055	0.055	-1.297	-0.005	0.005
N	40	WK193	0.378	0.649	2.332	0.581	0.087	24.678	0.094	0.094	-9.161	-0.061	0.073
N	41	WK170	0.867	0.634	1.806	-1.363	0.187	-0.137	-0.010	0.010	-1.845	-0.004	0.022
N	42	WK122	0.922	0.478	1.088	-2.542	0.186	-2.382	-0.061	0.061	-1.384	-0.009	0.009
N	43	WK130	0.726	0.547	1.474	-0.635	0.193	1.057	0.023	0.023	-2.605	-0.018	0.018
N	44	WK026	0.450	0.619	3.405	0.477	0.178	2.753	0.037	0.050	9.359	0.030	0.039
N	45	WK044	0.343	0.270	2.247	1.449	0.255	-6.917	-0.032	0.041	0.706	0.016	0.039
O	46	WK262	0.886	0.623	1.818	-1.506	0.220	-0.404	-0.021	0.027	-3.227	-0.002	0.003
N	47	WK144	0.741	0.688	3.287	-0.363	0.308	15.460	0.090	0.090	7.133	0.047	0.059
N	48	WK192	0.941	0.567	1.428	-2.545	0.178	-0.405	-0.029	0.029	-3.102	-0.016	0.016
N	49	WK056	0.888	0.645	1.817	-1.553	0.213	-0.486	-0.030	0.031	-16.590	-0.054	0.054
N	50	WK094	0.689	0.620	2.039	-0.356	0.217	-5.459	-0.072	0.084	-14.602	-0.072	0.072

Appendix D

New Item Information Table and Item Parameters

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-2.55,	1,	1.708,	-1.215,	0.161,	AR001
-2.55,	3,	1.731,	-1.051,	0.134,	AR005
-2.55,	4,	1.439,	-0.986,	0.107,	AR030
-2.55,	5,	1.318,	-0.980,	0.132,	AR021
-2.55,	2,	1.393,	-1.091,	0.137,	AR017
-2.55,	6,	1.888,	-0.883,	0.113,	AR002
-2.55,	7,	1.602,	-0.875,	0.184,	AR020
-2.55,	12,	1.733,	-0.681,	0.132,	AR011
-2.55,	9,	1.823,	-0.770,	0.186,	AR003
-2.55,	8,	1.628,	-0.789,	0.200,	AR004
-2.55,	11,	1.313,	-0.708,	0.141,	AR210
-2.55,	10,	1.177,	-0.716,	0.134,	AR007
-2.55,	14,	1.918,	-0.549,	0.070,	AR173
-2.55,	13,	1.695,	-0.561,	0.156,	AR006
-2.55,	16,	1.421,	-0.528,	0.089,	AR254
-2.55,	15,	1.397,	-0.543,	0.115,	AR211
-2.55,	18,	2.128,	-0.401,	0.189,	AR194
-2.55,	19,	1.774,	-0.392,	0.097,	AR158
-2.55,	17,	1.473,	-0.508,	0.124,	AR031
-2.55,	28,	2.375,	-0.270,	0.095,	AR025
-2.40,	1,	1.708,	-1.215,	0.161,	AR001
-2.40,	3,	1.731,	-1.051,	0.134,	AR005
-2.40,	4,	1.439,	-0.986,	0.107,	AR030
-2.40,	5,	1.318,	-0.980,	0.132,	AR021
-2.40,	2,	1.393,	-1.091,	0.137,	AR017
-2.40,	6,	1.888,	-0.883,	0.113,	AR002
-2.40,	7,	1.602,	-0.875,	0.184,	AR020
-2.40,	12,	1.733,	-0.681,	0.132,	AR011
-2.40,	9,	1.823,	-0.770,	0.186,	AR003
-2.40,	8,	1.628,	-0.789,	0.200,	AR004
-2.40,	11,	1.313,	-0.708,	0.141,	AR210
-2.40,	10,	1.177,	-0.716,	0.134,	AR007
-2.40,	14,	1.918,	-0.549,	0.070,	AR173
-2.40,	13,	1.695,	-0.561,	0.156,	AR006
-2.40,	16,	1.421,	-0.528,	0.089,	AR254
-2.40,	15,	1.397,	-0.543,	0.115,	AR211
-2.40,	18,	2.128,	-0.401,	0.189,	AR194
-2.40,	19,	1.774,	-0.392,	0.097,	AR158
-2.40,	17,	1.473,	-0.508,	0.124,	AR031
-2.40,	28,	2.375,	-0.270,	0.095,	AR025
-2.25,	1,	1.708,	-1.215,	0.161,	AR001
-2.25,	3,	1.731,	-1.051,	0.134,	AR005
-2.25,	4,	1.439,	-0.986,	0.107,	AR030
-2.25,	5,	1.318,	-0.980,	0.132,	AR021
-2.25,	2,	1.393,	-1.091,	0.137,	AR017
-2.25,	6,	1.888,	-0.883,	0.113,	AR002
-2.25,	7,	1.602,	-0.875,	0.184,	AR020

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-2.25,	12,	1.733,	-0.681,	0.132,	AR011
-2.25,	9,	1.823,	-0.770,	0.186,	AR003
-2.25,	8,	1.628,	-0.789,	0.200,	AR004
-2.25,	11,	1.313,	-0.708,	0.141,	AR210
-2.25,	10,	1.177,	-0.716,	0.134,	AR007
-2.25,	14,	1.918,	-0.549,	0.070,	AR173
-2.25,	13,	1.695,	-0.561,	0.156,	AR006
-2.25,	16,	1.421,	-0.528,	0.089,	AR254
-2.25,	15,	1.397,	-0.543,	0.115,	AR211
-2.25,	18,	2.128,	-0.401,	0.189,	AR194
-2.25,	19,	1.774,	-0.392,	0.097,	AR158
-2.25,	17,	1.473,	-0.508,	0.124,	AR031
-2.25,	28,	2.375,	-0.270,	0.095,	AR025
-2.10,	1,	1.708,	-1.215,	0.161,	AR001
-2.10,	3,	1.731,	-1.051,	0.134,	AR005
-2.10,	4,	1.439,	-0.986,	0.107,	AR030
-2.10,	5,	1.318,	-0.980,	0.132,	AR021
-2.10,	2,	1.393,	-1.091,	0.137,	AR017
-2.10,	6,	1.888,	-0.883,	0.113,	AR002
-2.10,	7,	1.602,	-0.875,	0.184,	AR020
-2.10,	12,	1.733,	-0.681,	0.132,	AR011
-2.10,	9,	1.823,	-0.770,	0.186,	AR003
-2.10,	8,	1.628,	-0.789,	0.200,	AR004
-2.10,	11,	1.313,	-0.708,	0.141,	AR210
-2.10,	10,	1.177,	-0.716,	0.134,	AR007
-2.10,	14,	1.918,	-0.549,	0.070,	AR173
-2.10,	13,	1.695,	-0.561,	0.156,	AR006
-2.10,	16,	1.421,	-0.528,	0.089,	AR254
-2.10,	15,	1.397,	-0.543,	0.115,	AR211
-2.10,	18,	2.128,	-0.401,	0.189,	AR194
-2.10,	19,	1.774,	-0.392,	0.097,	AR158
-2.10,	17,	1.473,	-0.508,	0.124,	AR031
-2.10,	28,	2.375,	-0.270,	0.095,	AR025
-1.95,	1,	1.708,	-1.215,	0.161,	AR001
-1.95,	3,	1.731,	-1.051,	0.134,	AR005
-1.95,	4,	1.439,	-0.986,	0.107,	AR030
-1.95,	5,	1.318,	-0.980,	0.132,	AR021
-1.95,	2,	1.393,	-1.091,	0.137,	AR017
-1.95,	6,	1.888,	-0.883,	0.113,	AR002
-1.95,	7,	1.602,	-0.875,	0.184,	AR020
-1.95,	12,	1.733,	-0.681,	0.132,	AR011
-1.95,	9,	1.823,	-0.770,	0.186,	AR003
-1.95,	8,	1.628,	-0.789,	0.200,	AR004
-1.95,	11,	1.313,	-0.708,	0.141,	AR210
-1.95,	10,	1.177,	-0.716,	0.134,	AR007
-1.95,	14,	1.918,	-0.549,	0.070,	AR173
-1.95,	13,	1.695,	-0.561,	0.156,	AR006

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.95,	16,	1.421,	-0.528,	0.089,	AR254
-1.95,	15,	1.397,	-0.543,	0.115,	AR211
-1.95,	18,	2.128,	-0.401,	0.189,	AR194
-1.95,	19,	1.774,	-0.392,	0.097,	AR158
-1.95,	17,	1.473,	-0.508,	0.124,	AR031
-1.95,	28,	2.375,	-0.270,	0.095,	AR025
-1.80,	1,	1.708,	-1.215,	0.161,	AR001
-1.80,	3,	1.731,	-1.051,	0.134,	AR005
-1.80,	4,	1.439,	-0.986,	0.107,	AR030
-1.80,	5,	1.318,	-0.980,	0.132,	AR021
-1.80,	2,	1.393,	-1.091,	0.137,	AR017
-1.80,	6,	1.888,	-0.883,	0.113,	AR002
-1.80,	7,	1.602,	-0.875,	0.184,	AR020
-1.80,	12,	1.733,	-0.681,	0.132,	AR011
-1.80,	9,	1.823,	-0.770,	0.186,	AR003
-1.80,	8,	1.628,	-0.789,	0.200,	AR004
-1.80,	11,	1.313,	-0.708,	0.141,	AR210
-1.80,	10,	1.177,	-0.716,	0.134,	AR007
-1.80,	14,	1.918,	-0.549,	0.070,	AR173
-1.80,	13,	1.695,	-0.561,	0.156,	AR006
-1.80,	16,	1.421,	-0.528,	0.089,	AR254
-1.80,	15,	1.397,	-0.543,	0.115,	AR211
-1.80,	18,	2.128,	-0.401,	0.189,	AR194
-1.80,	19,	1.774,	-0.392,	0.097,	AR158
-1.80,	17,	1.473,	-0.508,	0.124,	AR031
-1.80,	28,	2.375,	-0.270,	0.095,	AR025
-1.65,	1,	1.708,	-1.215,	0.161,	AR001
-1.65,	3,	1.731,	-1.051,	0.134,	AR005
-1.65,	4,	1.439,	-0.986,	0.107,	AR030
-1.65,	5,	1.318,	-0.980,	0.132,	AR021
-1.65,	2,	1.393,	-1.091,	0.137,	AR017
-1.65,	6,	1.888,	-0.883,	0.113,	AR002
-1.65,	7,	1.602,	-0.875,	0.184,	AR020
-1.65,	12,	1.733,	-0.681,	0.132,	AR011
-1.65,	9,	1.823,	-0.770,	0.186,	AR003
-1.65,	8,	1.628,	-0.789,	0.200,	AR004
-1.65,	11,	1.313,	-0.708,	0.141,	AR210
-1.65,	10,	1.177,	-0.716,	0.134,	AR007
-1.65,	14,	1.918,	-0.549,	0.070,	AR173
-1.65,	13,	1.695,	-0.561,	0.156,	AR006
-1.65,	16,	1.421,	-0.528,	0.089,	AR254
-1.65,	15,	1.397,	-0.543,	0.115,	AR211
-1.65,	18,	2.128,	-0.401,	0.189,	AR194
-1.65,	19,	1.774,	-0.392,	0.097,	AR158
-1.65,	17,	1.473,	-0.508,	0.124,	AR031
-1.65,	28,	2.375,	-0.270,	0.095,	AR025
-1.50,	1,	1.708,	-1.215,	0.161,	AR001

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.50,	3,	1.731,	-1.051,	0.134,	AR005
-1.50,	4,	1.439,	-0.986,	0.107,	AR030
-1.50,	5,	1.318,	-0.980,	0.132,	AR021
-1.50,	2,	1.393,	-1.091,	0.137,	AR017
-1.50,	6,	1.888,	-0.883,	0.113,	AR002
-1.50,	7,	1.602,	-0.875,	0.184,	AR020
-1.50,	12,	1.733,	-0.681,	0.132,	AR011
-1.50,	9,	1.823,	-0.770,	0.186,	AR003
-1.50,	8,	1.628,	-0.789,	0.200,	AR004
-1.50,	11,	1.313,	-0.708,	0.141,	AR210
-1.50,	10,	1.177,	-0.716,	0.134,	AR007
-1.50,	14,	1.918,	-0.549,	0.070,	AR173
-1.50,	13,	1.695,	-0.561,	0.156,	AR006
-1.50,	16,	1.421,	-0.528,	0.089,	AR254
-1.50,	15,	1.397,	-0.543,	0.115,	AR211
-1.50,	18,	2.128,	-0.401,	0.189,	AR194
-1.50,	19,	1.774,	-0.392,	0.097,	AR158
-1.50,	17,	1.473,	-0.508,	0.124,	AR031
-1.50,	28,	2.375,	-0.270,	0.095,	AR025
-1.35,	1,	1.708,	-1.215,	0.161,	AR001
-1.35,	3,	1.731,	-1.051,	0.134,	AR005
-1.35,	4,	1.439,	-0.986,	0.107,	AR030
-1.35,	5,	1.318,	-0.980,	0.132,	AR021
-1.35,	2,	1.393,	-1.091,	0.137,	AR017
-1.35,	6,	1.888,	-0.883,	0.113,	AR002
-1.35,	7,	1.602,	-0.875,	0.184,	AR020
-1.35,	12,	1.733,	-0.681,	0.132,	AR011
-1.35,	9,	1.823,	-0.770,	0.186,	AR003
-1.35,	8,	1.628,	-0.789,	0.200,	AR004
-1.35,	11,	1.313,	-0.708,	0.141,	AR210
-1.35,	10,	1.177,	-0.716,	0.134,	AR007
-1.35,	14,	1.918,	-0.549,	0.070,	AR173
-1.35,	13,	1.695,	-0.561,	0.156,	AR006
-1.35,	16,	1.421,	-0.528,	0.089,	AR254
-1.35,	15,	1.397,	-0.543,	0.115,	AR211
-1.35,	18,	2.128,	-0.401,	0.189,	AR194
-1.35,	19,	1.774,	-0.392,	0.097,	AR158
-1.35,	17,	1.473,	-0.508,	0.124,	AR031
-1.35,	28,	2.375,	-0.270,	0.095,	AR025
-1.20,	1,	1.708,	-1.215,	0.161,	AR001
-1.20,	3,	1.731,	-1.051,	0.134,	AR005
-1.20,	4,	1.439,	-0.986,	0.107,	AR030
-1.20,	5,	1.318,	-0.980,	0.132,	AR021
-1.20,	2,	1.393,	-1.091,	0.137,	AR017
-1.20,	6,	1.888,	-0.883,	0.113,	AR002
-1.20,	7,	1.602,	-0.875,	0.184,	AR020
-1.20,	12,	1.733,	-0.681,	0.132,	AR011

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.20,	9,	1.823,	-0.770,	0.186,	AR003
-1.20,	8,	1.628,	-0.789,	0.200,	AR004
-1.20,	11,	1.313,	-0.708,	0.141,	AR210
-1.20,	10,	1.177,	-0.716,	0.134,	AR007
-1.20,	14,	1.918,	-0.549,	0.070,	AR173
-1.20,	13,	1.695,	-0.561,	0.156,	AR006
-1.20,	16,	1.421,	-0.528,	0.089,	AR254
-1.20,	15,	1.397,	-0.543,	0.115,	AR211
-1.20,	18,	2.128,	-0.401,	0.189,	AR194
-1.20,	19,	1.774,	-0.392,	0.097,	AR158
-1.20,	17,	1.473,	-0.508,	0.124,	AR031
-1.20,	28,	2.375,	-0.270,	0.095,	AR025
-1.05,	3,	1.731,	-1.051,	0.134,	AR005
-1.05,	4,	1.439,	-0.986,	0.107,	AR030
-1.05,	5,	1.318,	-0.980,	0.132,	AR021
-1.05,	2,	1.393,	-1.091,	0.137,	AR017
-1.05,	6,	1.888,	-0.883,	0.113,	AR002
-1.05,	7,	1.602,	-0.875,	0.184,	AR020
-1.05,	1,	1.708,	-1.215,	0.161,	AR001
-1.05,	12,	1.733,	-0.681,	0.132,	AR011
-1.05,	9,	1.823,	-0.770,	0.186,	AR003
-1.05,	8,	1.628,	-0.789,	0.200,	AR004
-1.05,	11,	1.313,	-0.708,	0.141,	AR210
-1.05,	10,	1.177,	-0.716,	0.134,	AR007
-1.05,	14,	1.918,	-0.549,	0.070,	AR173
-1.05,	13,	1.695,	-0.561,	0.156,	AR006
-1.05,	16,	1.421,	-0.528,	0.089,	AR254
-1.05,	15,	1.397,	-0.543,	0.115,	AR211
-1.05,	18,	2.128,	-0.401,	0.189,	AR194
-1.05,	19,	1.774,	-0.392,	0.097,	AR158
-1.05,	17,	1.473,	-0.508,	0.124,	AR031
-1.05,	28,	2.375,	-0.270,	0.095,	AR025
-0.90,	6,	1.888,	-0.883,	0.113,	AR002
-0.90,	7,	1.602,	-0.875,	0.184,	AR020
-0.90,	3,	1.731,	-1.051,	0.134,	AR005
-0.90,	4,	1.439,	-0.986,	0.107,	AR030
-0.90,	5,	1.318,	-0.980,	0.132,	AR021
-0.90,	2,	1.393,	-1.091,	0.137,	AR017
-0.90,	12,	1.733,	-0.681,	0.132,	AR011
-0.90,	9,	1.823,	-0.770,	0.186,	AR003
-0.90,	8,	1.628,	-0.789,	0.200,	AR004
-0.90,	11,	1.313,	-0.708,	0.141,	AR210
-0.90,	10,	1.177,	-0.716,	0.134,	AR007
-0.90,	1,	1.708,	-1.215,	0.161,	AR001
-0.90,	14,	1.918,	-0.549,	0.070,	AR173
-0.90,	13,	1.695,	-0.561,	0.156,	AR006
-0.90,	16,	1.421,	-0.528,	0.089,	AR254

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.90,	15,	1.397,	-0.543,	0.115,	AR211
-0.90,	18,	2.128,	-0.401,	0.189,	AR194
-0.90,	19,	1.774,	-0.392,	0.097,	AR158
-0.90,	17,	1.473,	-0.508,	0.124,	AR031
-0.90,	28,	2.375,	-0.270,	0.095,	AR025
-0.75,	12,	1.733,	-0.681,	0.132,	AR011
-0.75,	9,	1.823,	-0.770,	0.186,	AR003
-0.75,	8,	1.628,	-0.789,	0.200,	AR004
-0.75,	11,	1.313,	-0.708,	0.141,	AR210
-0.75,	10,	1.177,	-0.716,	0.134,	AR007
-0.75,	6,	1.888,	-0.883,	0.113,	AR002
-0.75,	7,	1.602,	-0.875,	0.184,	AR020
-0.75,	14,	1.918,	-0.549,	0.070,	AR173
-0.75,	13,	1.695,	-0.561,	0.156,	AR006
-0.75,	16,	1.421,	-0.528,	0.089,	AR254
-0.75,	15,	1.397,	-0.543,	0.115,	AR211
-0.75,	3,	1.731,	-1.051,	0.134,	AR005
-0.75,	4,	1.439,	-0.986,	0.107,	AR030
-0.75,	5,	1.318,	-0.980,	0.132,	AR021
-0.75,	2,	1.393,	-1.091,	0.137,	AR017
-0.75,	18,	2.128,	-0.401,	0.189,	AR194
-0.75,	19,	1.774,	-0.392,	0.097,	AR158
-0.75,	17,	1.473,	-0.508,	0.124,	AR031
-0.75,	1,	1.708,	-1.215,	0.161,	AR001
-0.75,	28,	2.375,	-0.270,	0.095,	AR025
-0.60,	14,	1.918,	-0.549,	0.070,	AR173
-0.60,	13,	1.695,	-0.561,	0.156,	AR006
-0.60,	16,	1.421,	-0.528,	0.089,	AR254
-0.60,	15,	1.397,	-0.543,	0.115,	AR211
-0.60,	18,	2.128,	-0.401,	0.189,	AR194
-0.60,	19,	1.774,	-0.392,	0.097,	AR158
-0.60,	17,	1.473,	-0.508,	0.124,	AR031
-0.60,	12,	1.733,	-0.681,	0.132,	AR011
-0.60,	9,	1.823,	-0.770,	0.186,	AR003
-0.60,	8,	1.628,	-0.789,	0.200,	AR004
-0.60,	11,	1.313,	-0.708,	0.141,	AR210
-0.60,	10,	1.177,	-0.716,	0.134,	AR007
-0.60,	28,	2.375,	-0.270,	0.095,	AR025
-0.60,	22,	2.182,	-0.349,	0.127,	AR028
-0.60,	24,	1.928,	-0.328,	0.081,	AR208
-0.60,	25,	1.982,	-0.324,	0.099,	AR252
-0.60,	23,	1.953,	-0.344,	0.162,	AR271
-0.60,	6,	1.888,	-0.883,	0.113,	AR002
-0.60,	20,	1.882,	-0.371,	0.115,	AR010
-0.60,	21,	1.704,	-0.349,	0.121,	AR212
-0.45,	18,	2.128,	-0.401,	0.189,	AR194
-0.45,	19,	1.774,	-0.392,	0.097,	AR158

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.45,	17,	1.473,	-0.508,	0.124,	AR031
-0.45,	14,	1.918,	-0.549,	0.070,	AR173
-0.45,	13,	1.695,	-0.561,	0.156,	AR006
-0.45,	16,	1.421,	-0.528,	0.089,	AR254
-0.45,	15,	1.397,	-0.543,	0.115,	AR211
-0.45,	28,	2.375,	-0.270,	0.095,	AR025
-0.45,	22,	2.182,	-0.349,	0.127,	AR028
-0.45,	24,	1.928,	-0.328,	0.081,	AR208
-0.45,	25,	1.982,	-0.324,	0.099,	AR252
-0.45,	23,	1.953,	-0.344,	0.162,	AR271
-0.45,	20,	1.882,	-0.371,	0.115,	AR010
-0.45,	21,	1.704,	-0.349,	0.121,	AR212
-0.45,	29,	1.621,	-0.228,	0.163,	AR195
-0.45,	27,	1.439,	-0.296,	0.124,	AR269
-0.45,	26,	1.100,	-0.323,	0.145,	AR209
-0.45,	32,	2.307,	-0.104,	0.108,	AR102
-0.45,	31,	2.178,	-0.132,	0.257,	AR066
-0.45,	30,	1.817,	-0.218,	0.097,	AR233
-0.30,	28,	2.375,	-0.270,	0.095,	AR025
-0.30,	22,	2.182,	-0.349,	0.127,	AR028
-0.30,	24,	1.928,	-0.328,	0.081,	AR208
-0.30,	25,	1.982,	-0.324,	0.099,	AR252
-0.30,	23,	1.953,	-0.344,	0.162,	AR271
-0.30,	20,	1.882,	-0.371,	0.115,	AR010
-0.30,	21,	1.704,	-0.349,	0.121,	AR212
-0.30,	29,	1.621,	-0.228,	0.163,	AR195
-0.30,	27,	1.439,	-0.296,	0.124,	AR269
-0.30,	26,	1.100,	-0.323,	0.145,	AR209
-0.30,	32,	2.307,	-0.104,	0.108,	AR102
-0.30,	31,	2.178,	-0.132,	0.257,	AR066
-0.30,	30,	1.817,	-0.218,	0.097,	AR233
-0.30,	33,	1.499,	-0.084,	0.233,	AR262
-0.30,	18,	2.128,	-0.401,	0.189,	AR194
-0.30,	19,	1.774,	-0.392,	0.097,	AR158
-0.30,	17,	1.473,	-0.508,	0.124,	AR031
-0.30,	35,	2.859,	-0.058,	0.268,	AR137
-0.30,	38,	2.178,	0.023,	0.142,	AR215
-0.30,	39,	2.056,	0.027,	0.054,	AR105
-0.15,	32,	2.307,	-0.104,	0.108,	AR102
-0.15,	31,	2.178,	-0.132,	0.257,	AR066
-0.15,	30,	1.817,	-0.218,	0.097,	AR233
-0.15,	33,	1.499,	-0.084,	0.233,	AR262
-0.15,	35,	2.859,	-0.058,	0.268,	AR137
-0.15,	28,	2.375,	-0.270,	0.095,	AR025
-0.15,	22,	2.182,	-0.349,	0.127,	AR028
-0.15,	38,	2.178,	0.023,	0.142,	AR215
-0.15,	39,	2.056,	0.027,	0.054,	AR105

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.15,	24,	1.928,	-0.328,	0.081,	AR208
-0.15,	25,	1.982,	-0.324,	0.099,	AR252
-0.15,	23,	1.953,	-0.344,	0.162,	AR271
-0.15,	34,	1.969,	-0.075,	0.200,	AR161
-0.15,	20,	1.882,	-0.371,	0.115,	AR010
-0.15,	21,	1.704,	-0.349,	0.121,	AR212
-0.15,	42,	1.587,	0.049,	0.090,	AR024
-0.15,	29,	1.621,	-0.228,	0.163,	AR195
-0.15,	37,	1.349,	-0.007,	0.091,	AR236
-0.15,	41,	1.462,	0.034,	0.106,	AR067
-0.15,	27,	1.439,	-0.296,	0.124,	AR269
0.00,	35,	2.859,	-0.058,	0.268,	AR137
0.00,	38,	2.178,	0.023,	0.142,	AR215
0.00,	39,	2.056,	0.027,	0.054,	AR105
0.00,	34,	1.969,	-0.075,	0.200,	AR161
0.00,	42,	1.587,	0.049,	0.090,	AR024
0.00,	37,	1.349,	-0.007,	0.091,	AR236
0.00,	41,	1.462,	0.034,	0.106,	AR067
0.00,	36,	1.319,	-0.033,	0.222,	AR013
0.00,	40,	1.182,	0.027,	0.186,	AR019
0.00,	47,	2.917,	0.119,	0.204,	AR238
0.00,	54,	2.896,	0.192,	0.208,	AR125
0.00,	49,	2.680,	0.137,	0.148,	AR104
0.00,	32,	2.307,	-0.104,	0.108,	AR102
0.00,	51,	2.112,	0.156,	0.138,	AR234
0.00,	53,	2.293,	0.183,	0.152,	AR016
0.00,	31,	2.178,	-0.132,	0.257,	AR066
0.00,	45,	2.076,	0.116,	0.082,	AR237
0.00,	50,	1.923,	0.153,	0.107,	AR213
0.00,	52,	2.073,	0.166,	0.176,	AR217
0.00,	30,	1.817,	-0.218,	0.097,	AR233
0.15,	47,	2.917,	0.119,	0.204,	AR238
0.15,	54,	2.896,	0.192,	0.208,	AR125
0.15,	49,	2.680,	0.137,	0.148,	AR104
0.15,	51,	2.112,	0.156,	0.138,	AR234
0.15,	53,	2.293,	0.183,	0.152,	AR016
0.15,	45,	2.076,	0.116,	0.082,	AR237
0.15,	50,	1.923,	0.153,	0.107,	AR213
0.15,	52,	2.073,	0.166,	0.176,	AR217
0.15,	48,	1.612,	0.126,	0.090,	AR083
0.15,	43,	1.541,	0.090,	0.092,	AR012
0.15,	46,	1.333,	0.116,	0.134,	AR139
0.15,	44,	1.323,	0.108,	0.182,	AR058
0.15,	56,	3.061,	0.262,	0.264,	AR235
0.15,	65,	2.853,	0.339,	0.075,	AR227
0.15,	60,	2.864,	0.311,	0.223,	AR052
0.15,	35,	2.859,	-0.058,	0.268,	AR137

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
0.15,	64,	2.417,	0.333,	0.222,	AR035
0.15,	38,	2.178,	0.023,	0.142,	AR215
0.15,	62,	2.254,	0.326,	0.154,	AR047
0.15,	55,	2.173,	0.234,	0.164,	AR036
0.30,	56,	3.061,	0.262,	0.264,	AR235
0.30,	65,	2.853,	0.339,	0.075,	AR227
0.30,	60,	2.864,	0.311,	0.223,	AR052
0.30,	64,	2.417,	0.333,	0.222,	AR035
0.30,	62,	2.254,	0.326,	0.154,	AR047
0.30,	55,	2.173,	0.234,	0.164,	AR036
0.30,	59,	2.216,	0.308,	0.186,	AR222
0.30,	67,	2.135,	0.363,	0.231,	AR029
0.30,	61,	1.985,	0.325,	0.141,	AR126
0.30,	63,	1.908,	0.327,	0.228,	AR273
0.30,	57,	1.883,	0.271,	0.090,	AR145
0.30,	68,	1.783,	0.370,	0.151,	AR103
0.30,	66,	1.838,	0.344,	0.157,	AR239
0.30,	58,	1.329,	0.280,	0.395,	AR270
0.30,	47,	2.917,	0.119,	0.204,	AR238
0.30,	54,	2.896,	0.192,	0.208,	AR125
0.30,	49,	2.680,	0.137,	0.148,	AR104
0.30,	51,	2.112,	0.156,	0.138,	AR234
0.30,	53,	2.293,	0.183,	0.152,	AR016
0.30,	45,	2.076,	0.116,	0.082,	AR237
0.45,	74,	2.949,	0.434,	0.168,	AR228
0.45,	82,	2.914,	0.483,	0.190,	AR156
0.45,	84,	3.021,	0.492,	0.281,	AR048
0.45,	77,	2.765,	0.453,	0.117,	AR179
0.45,	86,	2.752,	0.507,	0.120,	AR018
0.45,	76,	2.597,	0.452,	0.067,	AR220
0.45,	81,	2.500,	0.483,	0.184,	AR219
0.45,	80,	2.578,	0.475,	0.187,	AR088
0.45,	70,	2.373,	0.423,	0.143,	AR175
0.45,	88,	2.490,	0.519,	0.169,	AR216
0.45,	71,	2.413,	0.424,	0.172,	AR256
0.45,	85,	2.420,	0.503,	0.193,	AR053
0.45,	73,	2.414,	0.430,	0.231,	AR197
0.45,	87,	2.410,	0.518,	0.244,	AR255
0.45,	79,	2.120,	0.456,	0.113,	AR261
0.45,	72,	2.292,	0.430,	0.173,	AR240
0.45,	75,	2.227,	0.434,	0.186,	AR034
0.45,	78,	2.205,	0.456,	0.220,	AR272
0.45,	69,	2.150,	0.411,	0.237,	AR157
0.45,	83,	2.074,	0.489,	0.057,	AR253
0.60,	105,	3.121,	0.653,	0.267,	AR039
0.60,	104,	3.057,	0.649,	0.137,	AR009
0.60,	98,	2.888,	0.593,	0.271,	AR196

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
0.60,	96,	2.728,	0.562,	0.276,	AR242
0.60,	99,	2.558,	0.609,	0.235,	AR199
0.60,	93,	2.374,	0.545,	0.119,	AR201
0.60,	102,	2.360,	0.641,	0.185,	AR274
0.60,	92,	2.326,	0.544,	0.200,	AR122
0.60,	95,	2.101,	0.552,	0.082,	AR198
0.60,	100,	2.279,	0.612,	0.140,	AR041
0.60,	101,	2.108,	0.619,	0.206,	AR054
0.60,	94,	2.252,	0.548,	0.210,	AR085
0.60,	103,	2.180,	0.641,	0.222,	AR069
0.60,	97,	2.255,	0.583,	0.223,	AR221
0.60,	91,	2.178,	0.542,	0.249,	AR042
0.60,	106,	2.089,	0.654,	0.096,	AR226
0.60,	90,	2.075,	0.539,	0.284,	AR023
0.60,	107,	1.448,	0.663,	0.145,	AR180
0.60,	89,	1.398,	0.535,	0.156,	AR037
0.60,	74,	2.949,	0.434,	0.168,	AR228
0.75,	116,	3.518,	0.740,	0.192,	AR243
0.75,	113,	3.309,	0.711,	0.206,	AR128
0.75,	124,	2.844,	0.810,	0.161,	AR108
0.75,	118,	2.515,	0.746,	0.146,	AR092
0.75,	119,	2.500,	0.750,	0.154,	AR160
0.75,	121,	2.689,	0.764,	0.203,	AR110
0.75,	126,	2.440,	0.819,	0.117,	AR182
0.75,	110,	2.430,	0.684,	0.119,	AR143
0.75,	122,	2.428,	0.769,	0.187,	AR075
0.75,	117,	2.325,	0.742,	0.189,	AR141
0.75,	111,	2.152,	0.705,	0.059,	AR275
0.75,	108,	2.141,	0.679,	0.132,	AR059
0.75,	125,	2.258,	0.817,	0.156,	AR115
0.75,	120,	2.168,	0.758,	0.186,	AR022
0.75,	114,	2.234,	0.715,	0.187,	AR147
0.75,	112,	2.234,	0.708,	0.188,	AR043
0.75,	115,	2.055,	0.718,	0.190,	AR257
0.75,	109,	1.624,	0.680,	0.119,	AR218
0.75,	123,	1.442,	0.793,	0.293,	AR214
0.75,	141,	3.377,	0.920,	0.165,	AR098
0.90,	141,	3.377,	0.920,	0.165,	AR098
0.90,	138,	3.479,	0.909,	0.212,	AR159
0.90,	130,	3.223,	0.847,	0.151,	AR200
0.90,	146,	3.211,	0.974,	0.203,	AR250
0.90,	139,	3.057,	0.916,	0.185,	AR068
0.90,	144,	2.971,	0.953,	0.234,	AR258
0.90,	128,	2.834,	0.834,	0.158,	AR140
0.90,	142,	2.717,	0.940,	0.174,	AR144
0.90,	136,	2.524,	0.882,	0.125,	AR142
0.90,	140,	2.556,	0.920,	0.130,	AR183

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
0.90,	132,	2.691,	0.856,	0.162,	AR049
0.90,	127,	2.564,	0.834,	0.170,	AR057
0.90,	133,	2.585,	0.860,	0.224,	AR178
0.90,	131,	2.423,	0.855,	0.177,	AR244
0.90,	137,	2.310,	0.909,	0.189,	AR223
0.90,	143,	2.456,	0.944,	0.208,	AR094
0.90,	134,	2.310,	0.861,	0.265,	AR246
0.90,	129,	2.171,	0.847,	0.086,	AR245
0.90,	145,	2.139,	0.958,	0.112,	AR100
0.90,	135,	2.263,	0.863,	0.158,	AR045
1.05,	149,	3.338,	1.013,	0.155,	AR186
1.05,	165,	3.400,	1.115,	0.196,	AR038
1.05,	154,	3.294,	1.054,	0.177,	AR247
1.05,	151,	3.018,	1.027,	0.181,	AR263
1.05,	163,	2.924,	1.107,	0.223,	AR229
1.05,	160,	3.053,	1.078,	0.245,	AR224
1.05,	153,	2.554,	1.039,	0.143,	AR138
1.05,	166,	2.614,	1.124,	0.181,	AR192
1.05,	164,	2.600,	1.112,	0.194,	AR130
1.05,	155,	2.598,	1.060,	0.218,	AR230
1.05,	161,	2.353,	1.086,	0.115,	AR176
1.05,	150,	2.306,	1.017,	0.183,	AR165
1.05,	147,	2.372,	0.979,	0.183,	AR091
1.05,	157,	2.323,	1.063,	0.237,	AR151
1.05,	159,	2.205,	1.077,	0.129,	AR131
1.05,	156,	2.120,	1.062,	0.155,	AR109
1.05,	152,	2.143,	1.039,	0.166,	AR097
1.05,	148,	2.046,	1.001,	0.073,	AR188
1.05,	162,	1.816,	1.089,	0.082,	AR169
1.05,	158,	1.659,	1.069,	0.094,	AR232
1.20,	173,	3.255,	1.178,	0.145,	AR167
1.20,	178,	3.146,	1.200,	0.178,	AR264
1.20,	180,	2.985,	1.211,	0.088,	AR149
1.20,	179,	2.701,	1.203,	0.252,	AR015
1.20,	183,	2.577,	1.244,	0.080,	AR081
1.20,	184,	2.529,	1.257,	0.156,	AR014
1.20,	175,	2.623,	1.192,	0.158,	AR187
1.20,	171,	2.691,	1.162,	0.192,	AR191
1.20,	176,	2.621,	1.194,	0.224,	AR259
1.20,	185,	2.381,	1.259,	0.186,	AR026
1.20,	177,	2.223,	1.198,	0.119,	AR032
1.20,	182,	2.103,	1.238,	0.133,	AR071
1.20,	186,	2.198,	1.274,	0.153,	AR116
1.20,	172,	2.150,	1.165,	0.173,	AR231
1.20,	170,	2.292,	1.155,	0.176,	AR133
1.20,	181,	2.092,	1.223,	0.070,	AR111
1.20,	169,	2.019,	1.152,	0.091,	AR040

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
1.20	168	2.004	1.146	0.112	AR202
1.20	167	1.953	1.140	0.216	AR118
1.20	174	1.944	1.181	0.231	AR166
1.35	197	3.927	1.340	0.138	AR046
1.35	204	3.759	1.402	0.155	AR096
1.35	188	3.337	1.280	0.210	AR114
1.35	202	3.282	1.386	0.107	AR076
1.35	187	3.192	1.277	0.109	AR099
1.35	196	3.030	1.328	0.162	AR120
1.35	199	3.050	1.369	0.199	AR070
1.35	192	3.034	1.306	0.211	AR074
1.35	198	2.972	1.342	0.245	AR077
1.35	190	2.895	1.298	0.141	AR101
1.35	203	2.575	1.400	0.105	AR205
1.35	201	2.544	1.382	0.109	AR206
1.35	193	2.473	1.308	0.190	AR135
1.35	189	2.442	1.293	0.224	AR168
1.35	194	2.252	1.318	0.191	AR190
1.35	191	1.978	1.299	0.123	AR089
1.35	206	1.974	1.424	0.143	AR203
1.35	200	2.087	1.379	0.151	AR119
1.35	205	2.094	1.421	0.188	AR148
1.35	195	2.033	1.324	0.191	AR249
1.50	224	3.556	1.543	0.199	AR082
1.50	214	3.240	1.500	0.121	AR184
1.50	222	3.296	1.533	0.181	AR193
1.50	211	2.995	1.478	0.099	AR171
1.50	226	3.081	1.560	0.181	AR204
1.50	208	2.959	1.455	0.198	AR080
1.50	210	2.773	1.475	0.074	AR207
1.50	215	2.764	1.502	0.133	AR134
1.50	209	2.720	1.460	0.180	AR064
1.50	223	2.743	1.538	0.181	AR033
1.50	221	2.599	1.533	0.104	AR172
1.50	207	2.356	1.445	0.089	AR123
1.50	213	2.471	1.494	0.203	AR061
1.50	218	2.383	1.526	0.222	AR163
1.50	220	2.442	1.530	0.319	AR174
1.50	219	2.108	1.530	0.177	AR063
1.50	216	2.068	1.506	0.136	AR072
1.50	212	2.074	1.482	0.167	AR113
1.50	225	1.982	1.559	0.250	AR044
1.50	217	1.763	1.513	0.245	AR008
1.65	229	4.466	1.591	0.143	AR090
1.65	238	4.274	1.672	0.183	AR152
1.65	231	3.950	1.608	0.201	AR155
1.65	239	3.808	1.691	0.252	AR251

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
1.65	227	3.277	1.579	0.214	AR106
1.65	228	2.975	1.581	0.183	AR267
1.65	241	2.813	1.704	0.154	AR060
1.65	237	2.874	1.671	0.210	AR093
1.65	232	2.514	1.610	0.159	AR079
1.65	236	2.630	1.649	0.254	AR117
1.65	242	2.479	1.709	0.056	AR051
1.65	233	2.122	1.627	0.165	AR095
1.65	230	2.105	1.607	0.187	AR027
1.65	240	2.177	1.694	0.217	AR065
1.65	234	1.769	1.632	0.057	AR056
1.65	235	1.703	1.644	0.237	AR189
1.65	243	4.290	1.728	0.123	AR170
1.65	246	3.645	1.762	0.163	AR084
1.65	224	3.556	1.543	0.199	AR082
1.65	249	3.610	1.816	0.200	AR153
1.80	243	4.290	1.728	0.123	AR170
1.80	246	3.645	1.762	0.163	AR084
1.80	249	3.610	1.816	0.200	AR153
1.80	247	2.967	1.769	0.156	AR177
1.80	248	2.529	1.812	0.134	AR107
1.80	245	2.514	1.756	0.201	AR078
1.80	250	2.473	1.823	0.136	AR087
1.80	251	2.495	1.839	0.211	AR127
1.80	244	2.228	1.731	0.119	AR136
1.80	229	4.466	1.591	0.143	AR090
1.80	238	4.274	1.672	0.183	AR152
1.80	231	3.950	1.608	0.201	AR155
1.80	239	3.808	1.691	0.252	AR251
1.80	227	3.277	1.579	0.214	AR106
1.80	228	2.975	1.581	0.183	AR267
1.80	241	2.813	1.704	0.154	AR060
1.80	237	2.874	1.671	0.210	AR093
1.80	232	2.514	1.610	0.159	AR079
1.80	236	2.630	1.649	0.254	AR117
1.80	242	2.479	1.709	0.056	AR051
1.95	254	2.817	1.924	0 285	AR265
1.95	253	2.032	1.884	0.129	AR062
1.95	252	1.986	1.877	0.176	AR268
1.95	243	4.290	1.728	0.123	AR170
1.95	246	3.645	1.762	0.163	AR084
1.95	249	3.610	1.816	0.200	AR153
1.95	247	2.967	1.769	0.156	AR177
1.95	248	2.529	1.812	0.134	AR107
1.95	245	2.514	1.756	0.201	AR078
1.95	250	2.473	1.823	0.136	AR087
1.95	251	2.495	1.839	0.211	AR127

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
1.95	244	2.228	1.731	0.119	AR136
1.95	229	4.466	1.591	0.143	AR090
1.95	238	4.274	1.672	0.183	AR152
1.95	231	3.950	1.608	0.201	AR155
1.95	239	3.808	1.691	0.252	AR251
1.95	227	3.277	1.579	0.214	AR106
1.95	228	2.975	1.581	0.183	AR267
1.95	241	2.813	1.704	0.154	AR060
1.95	237	2.874	1.671	0.210	AR093
2.10	254	2.817	1.924	0.285	AR265
2.10	253	2.032	1.884	0.129	AR062
2.10	252	1.986	1.877	0.176	AR268
2.10	243	4.290	1.728	0.123	AR170
2.10	246	3.645	1.762	0.163	AR084
2.10	249	3.610	1.816	0.200	AR153
2.10	247	2.967	1.769	0.156	AR177
2.10	248	2.529	1.812	0.134	AR107
2.10	245	2.514	1.756	0.201	AR078
2.10	250	2.473	1.823	0.136	AR087
2.10	251	2.495	1.839	0.211	AR127
2.10	244	2.228	1.731	0.119	AR136
2.10	229	4.466	1.591	0.143	AR090
2.10	238	4.274	1.672	0.183	AR152
2.10	231	3.950	1.608	0.201	AR155
2.10	239	3.808	1.691	0.252	AR251
2.10	227	3.277	1.579	0.214	AR106
2.10	228	2.975	1.581	0.183	AR267
2.10	241	2.813	1.704	0.154	AR060
2.10	237	2.874	1.671	0.210	AR093
2.25	254	2.817	1.924	0.285	AR265
2.25	253	2.032	1.884	0.129	AR062
2.25	252	1.986	1.877	0.176	AR268
2.25	243	4.290	1.728	0.123	AR170
2.25	246	3.645	1.762	0.163	AR084
2.25	249	3.610	1.816	0.200	AR153
2.25	247	2.967	1.769	0.156	AR177
2.25	248	2.529	1.812	0.134	AR107
2.25	245	2.514	1.756	0.201	AR078
2.25	250	2.473	1.823	0.136	AR087
2.25	251	2.495	1.839	0.211	AR127
2.25	244	2.228	1.731	0.119	AR136
2.25	229	4.466	1.591	0.143	AR090
2.25	238	4.274	1.672	0.183	AR152
2.25	231	3.950	1.608	0.201	AR155
2.25	239	3.808	1.691	0.252	AR251
2.25	227	3.277	1.579	0.214	AR106
2.25	228	2.975	1.581	0.183	AR267

New Information Table - AR

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
2.25,	241,	2.813,	1.704,	0.154,	AR060
2.25,	237,	2.874,	1.671,	0.210,	AR093
2.40,	254,	2.817,	1.924,	0.285,	AR265
2.40,	253,	2.032,	1.884,	0.129,	AR062
2.40,	252,	1.986,	1.877,	0.176,	AR268
2.40,	243,	4.290,	1.728,	0.123,	AR170
2.40,	246,	3.645,	1.762,	0.163,	AR084
2.40,	249,	3.610,	1.816,	0.200,	AR153
2.40,	247,	2.967,	1.769,	0.156,	AR177
2.40,	248,	2.529,	1.812,	0.134,	AR107
2.40,	245,	2.514,	1.756,	0.201,	AR078
2.40,	250,	2.473,	1.823,	0.136,	AR087
2.40,	251,	2.495,	1.839,	0.211,	AR127
2.40,	244,	2.228,	1.731,	0.119,	AR136
2.40,	229,	4.466,	1.591,	0.143,	AR090
2.40,	238,	4.274,	1.672,	0.183,	AR152
2.40,	231,	3.950,	1.608,	0.201,	AR155
2.40,	239,	3.808,	1.691,	0.252,	AR251
2.40,	227,	3.277,	1.579,	0.214,	AR106
2.40,	228,	2.975,	1.581,	0.183,	AR267
2.40,	241,	2.813,	1.704,	0.154,	AR060
2.40,	237,	2.874,	1.671,	0.210,	AR093
2.55,	254,	2.817,	1.924,	0.285,	AR265
2.55,	253,	2.032,	1.884,	0.129,	AR062
2.55,	252,	1.986,	1.877,	0.176,	AR268
2.55,	243,	4.290,	1.728,	0.123,	AR170
2.55,	246,	3.645,	1.762,	0.163,	AR084
2.55,	249,	3.610,	1.816,	0.200,	AR153
2.55,	247,	2.967,	1.769,	0.156,	AR177
2.55,	248,	2.529,	1.812,	0.134,	AR107
2.55,	245,	2.514,	1.756,	0.201,	AR078
2.55,	250,	2.473,	1.823,	0.136,	AR087
2.55,	251,	2.495,	1.839,	0.211,	AR127
2.55,	244,	2.228,	1.731,	0.119,	AR136
2.55,	229,	4.466,	1.591,	0.143,	AR090
2.55,	238,	4.274,	1.672,	0.183,	AR152
2.55,	231,	3.950,	1.608,	0.201,	AR155
2.55,	239,	3.808,	1.691,	0.252,	AR251
2.55,	227,	3.277,	1.579,	0.214,	AR106
2.55,	228,	2.975,	1.581,	0.183,	AR267
2.55,	241,	2.813,	1.704,	0.154,	AR060
2.55,	237,	2.874,	1.671,	0.210,	AR093

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-2.55	1	2.361	-1.601	0.157	WK168
-2.55	2	1.998	-1.581	0.162	WK176
-2.55	6	2.833	-1.467	0.207	WK191
-2.55	4	2.653	-1.514	0.163	WK115
-2.55	7	2.445	-1.463	0.172	WK199
-2.55	9	2.315	-1.446	0.231	WK268
-2.55	8	2.173	-1.454	0.133	WK181
-2.55	5	2.131	-1.507	0.170	WK107
-2.55	3	1.865	-1.543	0.166	WK162
-2.55	13	2.548	-1.349	0.117	WK145
-2.55	15	2.689	-1.339	0.177	WK109
-2.55	14	2.582	-1.342	0.202	WK059
-2.55	11	2.342	-1.410	0.160	WK271
-2.55	16	2.371	-1.285	0.178	WK192
-2.55	18	2.433	-1.279	0.265	WK066
-2.55	12	2.120	-1.383	0.127	WK175
-2.55	10	2.199	-1.420	0.165	WK050
-2.55	17	1.806	-1.283	0.186	WK122
-2.55	19	2.901	-1.269	0.154	WK079
-2.55	25	2.925	-1.190	0.195	WK246
-2.40	1	2.361	-1.601	0.157	WK168
-2.40	2	1.998	-1.581	0.162	WK176
-2.40	6	2.833	-1.467	0.207	WK191
-2.40	4	2.653	-1.514	0.163	WK115
-2.40	7	2.445	-1.463	0.172	WK199
-2.40	9	2.315	-1.446	0.231	WK268
-2.40	8	2.173	-1.454	0.133	WK181
-2.40	5	2.131	-1.507	0.170	WK107
-2.40	3	1.865	-1.543	0.166	WK162
-2.40	13	2.548	-1.349	0.117	WK145
-2.40	15	2.689	-1.339	0.177	WK109
-2.40	14	2.582	-1.342	0.202	WK059
-2.40	11	2.342	-1.410	0.160	WK271
-2.40	16	2.371	-1.285	0.178	WK192
-2.40	18	2.433	-1.279	0.265	WK066
-2.40	12	2.120	-1.383	0.127	WK175
-2.40	10	2.199	-1.420	0.165	WK050
-2.40	17	1.806	-1.283	0.186	WK122
-2.40	19	2.901	-1.269	0.154	WK079
-2.40	25	2.925	-1.190	0.195	WK246
-2.25	1	2.361	-1.601	0.157	WK168
-2.25	2	1.998	-1.581	0.162	WK176
-2.25	6	2.833	-1.467	0.207	WK191
-2.25	4	2.653	-1.514	0.163	WK115
-2.25	7	2.445	-1.463	0.172	WK199
-2.25	9	2.315	-1.446	0.231	WK268
-2.25	8	2.173	-1.454	0.133	WK181

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-2.25,	5,	2.131,	-1.507,	0.170,	WK107
-2.25,	3,	1.865,	-1.543,	0.166,	WK162
-2.25,	13,	2.548,	-1.349,	0.117,	WK145
-2.25,	15,	2.689,	-1.339,	0.177,	WK109
-2.25,	14,	2.582,	-1.342,	0.202,	WK059
-2.25,	11,	2.342,	-1.410,	0.160,	WK271
-2.25,	16,	2.371,	-1.285,	0.178,	WK192
-2.25,	18,	2.433,	-1.279,	0.265,	WK066
-2.25,	12,	2.120,	-1.383,	0.127,	WK175
-2.25,	10,	2.199,	-1.420,	0.165,	WK050
-2.25,	17,	1.806,	-1.283,	0.186,	WK122
-2.25,	19,	2.901,	-1.269,	0.154,	WK079
-2.25,	25,	2.925,	-1.190,	0.195,	WK246
-2.10,	1,	2.361,	-1.601,	0.157,	WK168
-2.10,	2,	1.998,	-1.581,	0.162,	WK176
-2.10,	6,	2.833,	-1.467,	0.207,	WK191
-2.10,	4,	2.653,	-1.514,	0.163,	WK115
-2.10,	7,	2.445,	-1.463,	0.172,	WK199
-2.10,	9,	2.315,	-1.446,	0.231,	WK268
-2.10,	8,	2.173,	-1.454,	0.133,	WK181
-2.10,	5,	2.131,	-1.507,	0.170,	WK107
-2.10,	3,	1.865,	-1.543,	0.166,	WK162
-2.10,	13,	2.548,	-1.349,	0.117,	WK145
-2.10,	15,	2.689,	-1.339,	0.177,	WK109
-2.10,	14,	2.582,	-1.342,	0.202,	WK059
-2.10,	11,	2.342,	-1.410,	0.160,	WK271
-2.10,	16,	2.371,	-1.285,	0.178,	WK192
-2.10,	18,	2.433,	-1.279,	0.265,	WK066
-2.10,	12,	2.120,	-1.383,	0.127,	WK175
-2.10,	10,	2.199,	-1.420,	0.165,	WK050
-2.10,	17,	1.806,	-1.283,	0.186,	WK122
-2.10,	19,	2.901,	-1.269,	0.154,	WK079
-2.10,	25,	2.925,	-1.190,	0.195,	WK246
-1.95,	1,	2.361,	-1.601,	0.157,	WK168
-1.95,	2,	1.998,	-1.581,	0.162,	WK176
-1.95,	6,	2.833,	-1.467,	0.207,	WK191
-1.95,	4,	2.653,	-1.514,	0.163,	WK115
-1.95,	7,	2.445,	-1.463,	0.172,	WK199
-1.95,	9,	2.315,	-1.446,	0.231,	WK268
-1.95,	8,	2.173,	-1.454,	0.133,	WK181
-1.95,	5,	2.131,	-1.507,	0.170,	WK107
-1.95,	3,	1.865,	-1.543,	0.166,	WK162
-1.95,	13,	2.548,	-1.349,	0.117,	WK145
-1.95,	15,	2.689,	-1.339,	0.177,	WK109
-1.95,	14,	2.582,	-1.342,	0.202,	WK059
-1.95,	11,	2.342,	-1.410,	0.160,	WK271
-1.95,	16,	2.371,	-1.285,	0.178,	WK192

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.95,	18,	2.433,	-1.279,	0.265,	WK066
-1.95,	12,	2.120,	-1.383,	0.127,	WK175
-1.95,	10,	2.199,	-1.420,	0.165,	WK050
-1.95,	17,	1.806,	-1.283,	0.186,	WK122
-1.95,	19,	2.901,	-1.269,	0.154,	WK079
-1.95,	25,	2.925,	-1.190,	0.195,	WK246
-1.80,	1,	2.361,	-1.601,	0.157,	WK168
-1.80,	2,	1.998,	-1.581,	0.162,	WK176
-1.80,	6,	2.833,	-1.467,	0.207,	WK191
-1.80,	4,	2.653,	-1.514,	0.163,	WK115
-1.80,	7,	2.445,	-1.463,	0.172,	WK199
-1.80,	9,	2.315,	-1.446,	0.231,	WK268
-1.80,	8,	2.173,	-1.454,	0.133,	WK181
-1.80,	5,	2.131,	-1.507,	0.170,	WK107
-1.80,	3,	1.865,	-1.543,	0.166,	WK162
-1.80,	13,	2.548,	-1.349,	0.117,	WK145
-1.80,	15,	2.689,	-1.339,	0.177,	WK109
-1.80,	14,	2.582,	-1.342,	0.202,	WK059
-1.80,	11,	2.342,	-1.410,	0.160,	WK271
-1.80,	16,	2.371,	-1.285,	0.178,	WK192
-1.80,	18,	2.433,	-1.279,	0.265,	WK066
-1.80,	12,	2.120,	-1.383,	0.127,	WK175
-1.80,	10,	2.199,	-1.420,	0.165,	WK050
-1.80,	17,	1.806,	-1.283,	0.186,	WK122
-1.80,	19,	2.901,	-1.269,	0.154,	WK079
-1.80,	25,	2.925,	-1.190,	0.195,	WK246
-1.65,	1,	2.361,	-1.601,	0.157,	WK168
-1.65,	2,	1.998,	-1.581,	0.162,	WK176
-1.65,	6,	2.833,	-1.467,	0.207,	WK191
-1.65,	4,	2.653,	-1.514,	0.163,	WK115
-1.65,	7,	2.445,	-1.463,	0.172,	WK199
-1.65,	9,	2.315,	-1.446,	0.231,	WK268
-1.65,	8,	2.173,	-1.454,	0.133,	WK181
-1.65,	5,	2.131,	-1.507,	0.170,	WK107
-1.65,	3,	1.865,	-1.543,	0.166,	WK162
-1.65,	13,	2.548,	-1.349,	0.117,	WK145
-1.65,	15,	2.689,	-1.339,	0.177,	WK109
-1.65,	14,	2.582,	-1.342,	0.202,	WK059
-1.65,	11,	2.342,	-1.410,	0.160,	WK271
-1.65,	16,	2.371,	-1.285,	0.178,	WK192
-1.65,	18,	2.433,	-1.279,	0.265,	WK066
-1.65,	12,	2.120,	-1.383,	0.127,	WK175
-1.65,	10,	2.199,	-1.420,	0.165,	WK050
-1.65,	17,	1.806,	-1.283,	0.186,	WK122
-1.65,	19,	2.901,	-1.269,	0.154,	WK079
-1.65,	25,	2.925,	-1.190,	0.195,	WK246
-1.50,	6,	2.833,	-1.467,	0.207,	WK191

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.50	4	2.653	-1.514	0.163	WK115
-1.50	7	2.445	-1.463	0.172	WK199
-1.50	9	2.315	-1.446	0.231	WK268
-1.50	8	2.173	-1.454	0.133	WK181
-1.50	5	2.131	-1.507	0.170	WK107
-1.50	3	1.865	-1.543	0.166	WK162
-1.50	1	2.361	-1.601	0.157	WK168
-1.50	2	1.998	-1.581	0.162	WK176
-1.50	13	2.548	-1.349	0.117	WK145
-1.50	15	2.689	-1.339	0.177	WK109
-1.50	14	2.582	-1.342	0.202	WK059
-1.50	11	2.342	-1.410	0.160	WK271
-1.50	16	2.371	-1.285	0.178	WK192
-1.50	18	2.433	-1.279	0.265	WK066
-1.50	12	2.120	-1.383	0.127	WK175
-1.50	10	2.199	-1.420	0.165	WK050
-1.50	17	1.806	-1.283	0.186	WK122
-1.50	19	2.901	-1.269	0.154	WK079
-1.50	25	2.925	-1.190	0.195	WK246
-1.35	13	2.548	-1.349	0.117	WK145
-1.35	15	2.689	-1.339	0.177	WK109
-1.35	14	2.582	-1.342	0.202	WK059
-1.35	11	2.342	-1.410	0.160	WK271
-1.35	16	2.371	-1.285	0.178	WK192
-1.35	18	2.433	-1.279	0.265	WK066
-1.35	12	2.120	-1.383	0.127	WK175
-1.35	10	2.199	-1.420	0.165	WK050
-1.35	17	1.806	-1.283	0.186	WK122
-1.35	19	2.901	-1.269	0.154	WK079
-1.35	25	2.925	-1.190	0.195	WK246
-1.35	26	2.836	-1.182	0.108	WK252
-1.35	24	2.559	-1.204	0.114	WK106
-1.35	21	2.620	-1.265	0.135	WK270
-1.35	29	2.589	-1.150	0.168	WK072
-1.35	28	2.615	-1.169	0.186	WK028
-1.35	31	2.495	-1.131	0.168	WK201
-1.35	27	2.406	-1.173	0.168	WK036
-1.35	32	2.323	-1.127	0.212	WK126
-1.35	30	2.286	-1.141	0.102	WK160
-1.20	19	2.901	-1.269	0.154	WK079
-1.20	25	2.925	-1.190	0.195	WK246
-1.20	26	2.836	-1.182	0.108	WK252
-1.20	24	2.559	-1.204	0.114	WK106
-1.20	21	2.620	-1.265	0.135	WK270
-1.20	29	2.589	-1.150	0.168	WK072
-1.20	28	2.615	-1.169	0.186	WK028
-1.20	31	2.495	-1.131	0.168	WK201

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-1.20,	27,	2.406,	-1.173,	0.168,	WK036
-1.20,	32,	2.323,	-1.127,	0.212,	WK126
-1.20,	30,	2.286,	-1.141,	0.102,	WK160
-1.20,	22,	2.272,	-1.260,	0.146,	WK180
-1.20,	20,	1.701,	-1.268,	0.120,	WK103
-1.20,	23,	1.610,	-1.239,	0.188,	WK043
-1.20,	13,	2.548,	-1.349,	0.117,	WK145
-1.20,	15,	2.689,	-1.339,	0.177,	WK109
-1.20,	14,	2.582,	-1.342,	0.202,	WK059
-1.20,	11,	2.342,	-1.410,	0.160,	WK271
-1.20,	16,	2.371,	-1.285,	0.178,	WK192
-1.20,	18,	2.433,	-1.279,	0.265,	WK066
-1.05,	40,	3.628,	-1.041,	0.195,	WK260
-1.05,	44,	3.403,	-0.999,	0.200,	WK183
-1.05,	41,	3.196,	-1.038,	0.114,	WK041
-1.05,	36,	3.002,	-1.084,	0.251,	WK087
-1.05,	39,	2.919,	-1.062,	0.312,	WK053
-1.05,	33,	2.617,	-1.124,	0.144,	WK017
-1.05,	47,	2.611,	-0.983,	0.220,	WK067
-1.05,	45,	2.403,	-0.989,	0.131,	WK240
-1.05,	42,	2.381,	-1.014,	0.159,	WK061
-1.05,	46,	2.328,	-0.985,	0.186,	WK077
-1.05,	34,	2.253,	-1.117,	0.125,	WK012
-1.05,	37,	2.103,	-1.083,	0.154,	WK178
-1.05,	43,	2.083,	-1.002,	0.130,	WK058
-1.05,	38,	1.796,	-1.063,	0.186,	WK154
-1.05,	35,	1.440,	-1.108,	0.132,	WK069
-1.05,	60,	4.756,	-0.868,	0.200,	WK004
-1.05,	56,	4.277,	-0.892,	0.110,	WK137
-1.05,	57,	4.113,	-0.885,	0.200,	WK237
-1.05,	64,	3.660,	-0.845,	0.121,	WK263
-1.05,	67,	3.271,	-0.827,	0.209,	WK272
-0.90,	60,	4.756,	-0.868,	0.200,	WK004
-0.90,	56,	4.277,	-0.892,	0.110,	WK137
-0.90,	57,	4.113,	-0.885,	0.200,	WK237
-0.90,	64,	3.660,	-0.845,	0.121,	WK263
-0.90,	67,	3.271,	-0.827,	0.209,	WK272
-0.90,	63,	3.113,	-0.847,	0.285,	WK261
-0.90,	59,	2.908,	-0.873,	0.133,	WK146
-0.90,	61,	3.045,	-0.858,	0.145,	WK244
-0.90,	55,	3.059,	-0.895,	0.192,	WK100
-0.90,	48,	2.829,	-0.971,	0.213,	WK238
-0.90,	51,	2.717,	-0.939,	0.229,	WK182
-0.90,	54,	2.653,	-0.910,	0.115,	WK143
-0.90,	62,	2.679,	-0.857,	0.130,	WK242
-0.90,	65,	2.512,	-0.845,	0.200,	WK021
-0.90,	52,	2.636,	-0.926,	0.231,	WK124

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.90,	53,	2.348,	-0.915,	0.145,	WK226
-0.90,	50,	2.389,	-0.948,	0.200,	WK105
-0.90,	58,	2.284,	-0.874,	0.152,	WK057
-0.90,	66,	1.965,	-0.831,	0.138,	WK009
-0.90,	49,	1.972,	-0.965,	0.145,	WK189
-0.75,	81,	8.216,	-0.710,	0.200,	WK131
-0.75,	68,	5.770,	-0.820,	0.200,	WK167
-0.75,	72,	3.865,	-0.811,	0.158,	WK225
-0.75,	69,	3.712,	-0.817,	0.252,	WK089
-0.75,	78,	3.532,	-0.714,	0.200,	WK269
-0.75,	74,	3.408,	-0.765,	0.220,	WK024
-0.75,	87,	3.405,	-0.687,	0.285,	WK165
-0.75,	76,	3.224,	-0.755,	0.199,	WK027
-0.75,	83,	3.028,	-0.709,	0.200,	WK179
-0.75,	85,	3.096,	-0.692,	0.205,	WK262
-0.75,	86,	3.018,	-0.688,	0.213,	WK056
-0.75,	73,	2.796,	-0.809,	0.200,	WK208
-0.75,	71,	2.831,	-0.811,	0.339,	WK196
-0.75,	75,	2.546,	-0.757,	0.149,	WK185
-0.75,	79,	2.507,	-0.714,	0.169,	WK161
-0.75,	84,	2.537,	-0.693,	0.173,	WK127
-0.75,	70,	2.647,	-0.817,	0.261,	WK119
-0.75,	82,	2.401,	-0.709,	0.200,	WK157
-0.75,	77,	2.233,	-0.736,	0.200,	WK166
-0.75,	80,	1.870,	-0.713,	0.097,	WK243
-0.60,	104,	8.592,	-0.532,	0.200,	WK033
-0.60,	92,	4.881,	-0.630,	0.200,	WK266
-0.60,	105,	4.048,	-0.531,	0.187,	WK159
-0.60,	100,	4.011,	-0.542,	0.402,	WK150
-0.60,	106,	3.604,	-0.528,	0.253,	WK205
-0.60,	99,	3.489,	-0.564,	0.200,	WK245
-0.60,	103,	3.402,	-0.533,	0.209,	WK049
-0.60,	93,	2.983,	-0.606,	0.159,	WK045
-0.60,	97,	3.000,	-0.573,	0.187,	WK170
-0.60,	94,	2.854,	-0.606,	0.132,	WK190
-0.60,	89,	2.730,	-0.663,	0.189,	WK016
-0.60,	88,	2.730,	-0.671,	0.200,	WK198
-0.60,	101,	2.503,	-0.538,	0.253,	WK187
-0.60,	96,	2.373,	-0.575,	0.181,	WK259
-0.60,	90,	2.168,	-0.644,	0.090,	WK054
-0.60,	91,	2.254,	-0.637,	0.185,	WK203
-0.60,	98,	1.839,	-0.565,	0.164,	WK052
-0.60,	102,	1.556,	-0.535,	0.118,	WK212
-0.60,	95,	1.534,	-0.578,	0.131,	WK062
-0.60,	115,	5.027,	-0.449,	0.200,	WK096
-0.45,	115,	5.027,	-0.449,	0.200,	WK096
-0.45,	122,	4.522,	-0.392,	0.244,	WK265

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.45,	124,	4.110,	-0.379,	0.200,	WK188
-0.45,	116,	4.062,	-0.436,	0.200,	WK076
-0.45,	112,	3.911,	-0.474,	0.331,	WK134
-0.45,	109,	3.416,	-0.490,	0.145,	WK101
-0.45,	123,	3.171,	-0.381,	0.304,	WK241
-0.45,	114,	3.246,	-0.463,	0.357,	WK085
-0.45,	113,	2.963,	-0.471,	0.120,	WK206
-0.45,	110,	2.967,	-0.489,	0.185,	WK018
-0.45,	111,	3.028,	-0.485,	0.219,	WK275
-0.45,	120,	2.926,	-0.399,	0.384,	WK005
-0.45,	117,	2.591,	-0.421,	0.230,	WK200
-0.45,	107,	2.136,	-0.515,	0.248,	WK112
-0.45,	121,	1.679,	-0.398,	0.137,	WK139
-0.45,	108,	1.611,	-0.507,	0.181,	WK080
-0.45,	118,	1.637,	-0.413,	0.200,	WK075
-0.45,	119,	1.408,	-0.401,	0.200,	WK186
-0.45,	104,	8.592,	-0.532,	0.200,	WK033
-0.45,	92,	4.881,	-0.630,	0.200,	WK266
-0.30,	138,	4.358,	-0.259,	0.168,	WK227
-0.30,	140,	4.460,	-0.249,	0.194,	WK113
-0.30,	135,	4.144,	-0.284,	0.200,	WK040
-0.30,	130,	3.746,	-0.319,	0.190,	WK152
-0.30,	125,	3.756,	-0.374,	0.223,	WK158
-0.30,	136,	3.443,	-0.279,	0.183,	WK229
-0.30,	127,	3.359,	-0.366,	0.202,	WK095
-0.30,	132,	3.337,	-0.297,	0.212,	WK211
-0.30,	128,	3.480,	-0.362,	0.296,	WK149
-0.30,	131,	3.260,	-0.314,	0.203,	WK171
-0.30,	137,	3.238,	-0.265,	0.281,	WK228
-0.30,	143,	3.017,	-0.235,	0.200,	WK250
-0.30,	141,	3.027,	-0.242,	0.247,	WK264
-0.30,	144,	2.959,	-0.229,	0.273,	WK082
-0.30,	142,	2.809,	-0.240,	0.285,	WK118
-0.30,	133,	2.596,	-0.296,	0.208,	WK204
-0.30,	139,	2.558,	-0.258,	0.266,	WK135
-0.30,	126,	2.589,	-0.367,	0.269,	WK008
-0.30,	134,	2.238,	-0.290,	0.300,	WK184
-0.30,	129,	1.989,	-0.355,	0.167,	WK007
-0.15,	150,	6.527,	-0.155,	0.200,	WK086
-0.15,	157,	3.802,	-0.083,	0.229,	WK060
-0.15,	149,	3.829,	-0.155,	0.357,	WK051
-0.15,	154,	3.338,	-0.101,	0.194,	WK230
-0.15,	152,	3.156,	-0.153,	0.140,	WK025
-0.15,	147,	2.851,	-0.194,	0.200,	WK108
-0.15,	151,	2.674,	-0.153,	0.161,	WK114
-0.15,	156,	2.543,	-0.088,	0.175,	WK064
-0.15,	145,	2.591,	-0.215,	0.259,	WK248

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
-0.15,	153,	2.448,	-0.136,	0.193,	WK130
-0.15,	148,	2.478,	-0.166,	0.201,	WK046
-0.15,	155,	2.030,	-0.094,	0.100,	WK217
-0.15,	146,	1.507,	-0.206,	0.200,	WK078
-0.15,	168,	5.460,	0.028,	0.308,	WK144
-0.15,	166,	5.282,	0.016,	0.200,	WK132
-0.15,	172,	5.042,	0.039,	0.158,	WK209
-0.15,	163,	4.999,	-0.000,	0.260,	WK032
-0.15,	138,	4.358,	-0.259,	0.168,	WK227
-0.15,	140,	4.460,	-0.249,	0.194,	WK113
-0.15,	135,	4.144,	-0.284,	0.200,	WK040
0.00,	168,	5.460,	0.028,	0.308,	WK144
0.00,	166,	5.282,	0.016,	0.200,	WK132
0.00,	172,	5.042,	0.039,	0.158,	WK209
0.00,	163,	4.999,	-0.000,	0.260,	WK032
0.00,	165,	4.135,	0.013,	0.200,	WK219
0.00,	164,	4.066,	0.005,	0.215,	WK274
0.00,	167,	3.802,	0.019,	0.298,	WK084
0.00,	174,	3.566,	0.042,	0.312,	WK065
0.00,	173,	3.352,	0.041,	0.152,	WK074
0.00,	159,	3.304,	-0.067,	0.200,	WK083
0.00,	169,	3.386,	0.032,	0.217,	WK094
0.00,	171,	3.143,	0.039,	0.175,	WK141
0.00,	162,	2.999,	-0.009,	0.182,	WK239
0.00,	160,	2.901,	-0.063,	0.200,	WK068
0.00,	176,	2.892,	0.049,	0.152,	WK048
0.00,	177,	2.900,	0.059,	0.177,	WK116
0.00,	158,	2.874,	-0.070,	0.244,	WK273
0.00,	175,	2.562,	0.046,	0.137,	WK099
0.00,	170,	2.400,	0.035,	0.163,	WK172
0.00,	161,	2.066,	-0.032,	0.193,	WK117
0.15,	184,	5.167,	0.121,	0.200,	WK133
0.15,	185,	4.381,	0.126,	0.200,	WK216
0.15,	187,	4.376,	0.172,	0.297,	WK267
0.15,	178,	3.352,	0.088,	0.222,	WK015
0.15,	180,	2.934,	0.113,	0.200,	WK088
0.15,	191,	2.967,	0.223,	0.235,	WK129
0.15,	188,	2.703,	0.180,	0.230,	WK202
0.15,	183,	2.868,	0.118,	0.362,	WK110
0.15,	179,	2.546,	0.099,	0.198,	WK120
0.15,	189,	2.169,	0.193,	0.120,	WK091
0.15,	186,	2.123,	0.172,	0.200,	WK090
0.15,	190,	2.037,	0.206,	0.129,	WK249
0.15,	182,	1.939,	0.116,	0.303,	WK042
0.15,	181,	1.620,	0.116,	0.137,	WK136
0.15,	192,	1.064,	0.224,	0.200,	WK047
0.15,	168,	5.460,	0.028,	0.308,	WK144

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
0.15,	166,	5.282,	0.016,	0.200,	WK132
0.15,	194,	5.259,	0.244,	0.324,	WK232
0.15,	172,	5.042,	0.039,	0.158,	WK209
0.15,	163,	4.999,	-0.000,	0.260,	WK032
0.30,	194,	5.259,	0.244,	0.324,	WK232
0.30,	207,	4.202,	0.353,	0.200,	WK256
0.30,	208,	3.863,	0.360,	0.199,	WK213
0.30,	200,	3.477,	0.309,	0.094,	WK221
0.30,	203,	3.372,	0.324,	0.200,	WK257
0.30,	195,	3.369,	0.253,	0.202,	WK254
0.30,	199,	3.399,	0.303,	0.299,	WK194
0.30,	204,	2.755,	0.326,	0.165,	WK253
0.30,	201,	2.790,	0.310,	0.244,	WK030
0.30,	206,	2.686,	0.352,	0.175,	WK247
0.30,	197,	2.104,	0.257,	0.151,	WK255
0.30,	205,	1.999,	0.350,	0.137,	WK148
0.30,	196,	1.747,	0.257,	0.221,	WK006
0.30,	202,	1.645,	0.313,	0.176,	WK156
0.30,	193,	1.246,	0.240,	0.200,	WK093
0.30,	198,	1.025,	0.267,	0.200,	WK174
0.30,	184,	5.167,	0.121,	0.200,	WK133
0.30,	185,	4.381,	0.126,	0.200,	WK216
0.30,	187,	4.376,	0.172,	0.297,	WK267
0.30,	178,	3.352,	0.088,	0.222,	WK015
0.45,	210,	4.740,	0.394,	0.245,	WK218
0.45,	213,	4.262,	0.437,	0.275,	WK153
0.45,	220,	3.880,	0.475,	0.131,	WK037
0.45,	215,	3.642,	0.453,	0.209,	WK071
0.45,	222,	3.341,	0.507,	0.290,	WK055
0.45,	209,	3.419,	0.377,	0.361,	WK121
0.45,	212,	3.067,	0.434,	0.200,	WK197
0.45,	221,	3.096,	0.506,	0.226,	WK234
0.45,	214,	2.793,	0.452,	0.200,	WK092
0.45,	223,	2.629,	0.510,	0.192,	WK125
0.45,	211,	2.519,	0.411,	0.271,	WK142
0.45,	217,	2.311,	0.461,	0.387,	WK111
0.45,	219,	1.902,	0.471,	0.280,	WK019
0.45,	218,	1.777,	0.465,	0.117,	WK169
0.45,	216,	1.389,	0.455,	0.123,	WK147
0.45,	226,	6.325,	0.560,	0.288,	WK258
0.45,	224,	5.655,	0.534,	0.178,	WK026
0.45,	227,	4.550,	0.571,	0.164,	WK104
0.45,	225,	4.058,	0.539,	0.165,	WK177
0.45,	228,	3.874,	0.597,	0.087,	WK193
0.60,	226,	6.325,	0.560,	0.288,	WK258
0.60,	224,	5.655,	0.534,	0.178,	WK026
0.60,	227,	4.550,	0.571,	0.164,	WK104

New Information Table - WK

Diff	Itm	Parameter Est.			Master
Level	#	A	B	C	Id
0.60	225	4.058	0.539	0.165	WK177
0.60	228	3.874	0.597	0.087	WK193
0.60	229	3.892	0.605	0.152	WK231
0.60	231	3.868	0.631	0.181	WK014
0.60	230	3.464	0.614	0.191	WK214
0.60	234	2.423	0.648	0.198	WK011
0.60	232	2.440	0.633	0.200	WK010
0.60	233	2.375	0.645	0.200	WK073
0.60	210	4.740	0.394	0.245	WK218
0.60	213	4.262	0.437	0.275	WK153
0.60	220	3.880	0.475	0.131	WK037
0.60	215	3.642	0.453	0.209	WK071
0.60	222	3.341	0.507	0.290	WK055
0.60	209	3.419	0.377	0.361	WK121
0.60	212	3.067	0.434	0.200	WK197
0.60	221	3.096	0.506	0.226	WK234
0.60	214	2.793	0.452	0.200	WK092
0.75	235	4.745	0.720	0.289	WK039
0.75	236	3.492	0.766	0.242	WK128
0.75	242	5.450	0.938	0.077	WK222
0.75	239	3.703	0.880	0.094	WK223
0.75	241	3.823	0.932	0.167	WK081
0.75	237	3.772	0.833	0.335	WK023
0.75	244	2.960	0.969	0.397	WK029
0.75	238	2.859	0.847	0.374	WK173
0.75	243	2.630	0.966	0.375	WK013
0.75	240	1.958	0.916	0.203	WK070
0.75	226	6.325	0.560	0.288	WK258
0.75	224	5.655	0.534	0.178	WK026
0.75	227	4.550	0.571	0.164	WK104
0.75	225	4.058	0.539	0.165	WK177
0.75	228	3.874	0.597	0.087	WK193
0.75	229	3.892	0.605	0.152	WK231
0.75	231	3.868	0.631	0.181	WK014
0.75	230	3.464	0.614	0.191	WK214
0.75	234	2.423	0.648	0.198	WK011
0.75	232	2.440	0.633	0.200	WK010
0.90	242	5.450	0.938	0.077	WK222
0.90	239	3.703	0.880	0.094	WK223
0.90	241	3.823	0.932	0.167	WK081
0.90	237	3.772	0.833	0.335	WK023
0.90	244	2.960	0.969	0.397	WK029
0.90	238	2.859	0.847	0.374	WK173
0.90	243	2.630	0.966	0.375	WK013
0.90	240	1.958	0.916	0.203	WK070
0.90	246	5.592	1.016	0.243	WK155
0.90	248	3.733	1.119	0.255	WK044

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
0.90	247	2.672	1.060	0.196	WK102
0.90	245	2.568	0.999	0.200	WK207
0.90	235	4.745	0.720	0.289	WK039
0.90	236	3.492	0.766	0.242	WK128
0.90	252	4.237	1.232	0.212	WK195
0.90	249	3.860	1.147	0.088	WK215
0.90	250	3.495	1.168	0.230	WK038
0.90	251	1.996	1.196	0.200	WK063
0.90	226	6.325	0.560	0.288	WK258
0.90	224	5.655	0.534	0.178	WK026
1.05	246	5.592	1.016	0.243	WK155
1.05	248	3.733	1.119	0.255	WK044
1.05	247	2.672	1.060	0.196	WK102
1.05	245	2.568	0.999	0.200	WK207
1.05	242	5.450	0.938	0.077	WK222
1.05	239	3.703	0.880	0.094	WK223
1.05	241	3.823	0.932	0.167	WK081
1.05	237	3.772	0.833	0.335	WK023
1.05	244	2.960	0.969	0.397	WK029
1.05	238	2.859	0.847	0.374	WK173
1.05	243	2.630	0.966	0.375	WK013
1.05	240	1.958	0.916	0.203	WK070
1.05	252	4.237	1.232	0.212	WK195
1.05	249	3.860	1.147	0.088	WK215
1.05	250	3.495	1.168	0.230	WK038
1.05	251	1.996	1.196	0.200	WK063
1.05	235	4.745	0.720	0.289	WK039
1.05	236	3.492	0.766	0.242	WK128
1.05	253	5.696	1.303	0.139	WK022
1.05	254	3.014	1.320	0.134	WK224
1.20	252	4.237	1.232	0.212	WK195
1.20	249	3.860	1.147	0.088	WK215
1.20	250	3.495	1.168	0.230	WK038
1.20	251	1.996	1.196	0.200	WK063
1.20	253	5.696	1.303	0.139	WK022
1.20	254	3.014	1.320	0.134	WK224
1.20	246	5.592	1.016	0.243	WK155
1.20	248	3.733	1.119	0.255	WK044
1.20	247	2.672	1.060	0.196	WK102
1.20	245	2.568	0.999	0.200	WK207
1.20	242	5.450	0.938	0.077	WK222
1.20	239	3.703	0.880	0.094	WK223
1.20	241	3.823	0.932	0.167	WK081
1.20	237	3.772	0.833	0.335	WK023
1.20	244	2.960	0.969	0.397	WK029
1.20	238	2.859	0.847	0.374	WK173
1.20	243	2.630	0.966	0.375	WK013

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
1.20,	240,	1.958,	0.916,	0.203,	WK070
1.20,	256,	4.298,	1.516,	0.422,	WK020
1.20,	255,	3.918,	1.508,	0.099,	WK034
1.35,	253,	5.696,	1.303,	0.139,	WK022
1.35,	254,	3.014,	1.320,	0.134,	WK224
1.35,	252,	4.237,	1.232,	0.212,	WK195
1.35,	249,	3.860,	1.147,	0.088,	WK215
1.35,	250,	3.495,	1.168,	0.230,	WK038
1.35,	251,	1.996,	1.196,	0.200,	WK063
1.35,	256,	4.298,	1.516,	0.422,	WK020
1.35,	255,	3.918,	1.508,	0.099,	WK034
1.35,	257,	3.170,	1.531,	0.200,	WK236
1.35,	246,	5.592,	1.016,	0.243,	WK155
1.35,	248,	3.733,	1.119,	0.255,	WK044
1.35,	247,	2.672,	1.060,	0.196,	WK102
1.35,	245,	2.568,	0.999,	0.200,	WK207
1.35,	242,	5.450,	0.938,	0.077,	WK222
1.35,	239,	3.703,	0.880,	0.094,	WK223
1.35,	241,	3.823,	0.932,	0.167,	WK081
1.35,	237,	3.772,	0.833,	0.335,	WK023
1.35,	244,	2.960,	0.969,	0.397,	WK029
1.35,	238,	2.859,	0.847,	0.374,	WK173
1.35,	243,	2.630,	0.966,	0.375,	WK013
1.50,	256,	4.298,	1.516,	0.422,	WK020
1.50,	255,	3.918,	1.508,	0.099,	WK034
1.50,	257,	3.170,	1.531,	0.200,	WK236
1.50,	253,	5.696,	1.303,	0.139,	WK022
1.50,	254,	3.014,	1.320,	0.134,	WK224
1.50,	252,	4.237,	1.232,	0.212,	WK195
1.50,	249,	3.860,	1.147,	0.088,	WK215
1.50,	250,	3.495,	1.168,	0.230,	WK038
1.50,	251,	1.996,	1.196,	0.200,	WK063
1.50,	246,	5.592,	1.016,	0.243,	WK155
1.50,	248,	3.733,	1.119,	0.255,	WK044
1.50,	247,	2.672,	1.060,	0.196,	WK102
1.50,	245,	2.568,	0.999,	0.200,	WK207
1.50,	242,	5.450,	0.938,	0.077,	WK222
1.50,	239,	3.703,	0.880,	0.094,	WK223
1.50,	241,	3.823,	0.932,	0.167,	WK081
1.50,	237,	3.772,	0.833,	0.335,	WK023
1.50,	244,	2.960,	0.969,	0.397,	WK029
1.50,	238,	2.859,	0.847,	0.374,	WK173
1.50,	243,	2.630,	0.966,	0.375,	WK013
1.65,	256,	4.298,	1.516,	0.422,	WK020
1.65,	255,	3.918,	1.508,	0.099,	WK034
1.65,	257,	3.170,	1.531,	0.200,	WK236
1.65,	253,	5.696,	1.303,	0.139,	WK022

New Information Table - WK

Diff	Itm	Parameter Est.			Master
Level	#	A	B	C	Id
1.65	254	3.014	1.320	0.134	WK224
1.65	252	4.237	1.232	0.212	WK195
1.65	249	3.860	1.147	0.088	WK215
1.65	250	3.495	1.168	0.230	WK038
1.65	251	1.996	1.196	0.200	WK063
1.65	246	5.592	1.016	0.243	WK155
1.65	248	3.733	1.119	0.255	WK044
1.65	247	2.672	1.060	0.196	WK102
1.65	245	2.568	0.999	0.200	WK207
1.65	242	5.450	0.938	0.077	WK222
1.65	239	3.703	0.880	0.094	WK223
1.65	241	3.823	0.932	0.167	WK081
1.65	237	3.772	0.833	0.335	WK023
1.65	244	2.960	0.969	0.397	WK029
1.65	238	2.859	0.847	0.374	WK173
1.65	243	2.630	0.966	0.375	WK013
1.80	256	4.298	1.516	0.422	WK020
1.80	255	3.918	1.508	0.099	WK034
1.80	257	3.170	1.531	0.200	WK236
1.80	253	5.696	1.303	0.139	WK022
1.80	254	3.014	1.320	0.134	WK224
1.80	252	4.237	1.232	0.212	WK195
1.80	249	3.860	1.147	0.088	WK215
1.80	250	3.495	1.168	0.230	WK038
1.80	251	1.996	1.196	0.200	WK063
1.80	246	5.592	1.016	0.243	WK155
1.80	248	3.733	1.119	0.255	WK044
1.80	247	2.672	1.060	0.196	WK102
1.80	245	2.568	0.999	0.200	WK207
1.80	242	5.450	0.938	0.077	WK222
1.80	239	3.703	0.880	0.094	WK223
1.80	241	3.823	0.932	0.167	WK081
1.80	237	3.772	0.833	0.335	WK023
1.80	244	2.960	0.969	0.397	WK029
1.80	238	2.859	0.847	0.374	WK173
1.80	243	2.630	0.966	0.375	WK013
1.95	256	4.298	1.516	0.422	WK020
1.95	255	3.918	1.508	0.099	WK034
1.95	257	3.170	1.531	0.200	WK236
1.95	253	5.696	1.303	0.139	WK022
1.95	254	3.014	1.320	0.134	WK224
1.95	252	4.237	1.232	0.212	WK195
1.95	249	3.860	1.147	0.088	WK215
1.95	250	3.495	1.168	0.230	WK038
1.95	251	1.996	1.196	0.200	WK063
1.95	246	5.592	1.016	0.243	WK155
1.95	248	3.733	1.119	0.255	WK044

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
1.95,	247,	2.672,	1.060,	0.196,	WK102
1.95,	245,	2.568,	0.999,	0.200,	WK207
1.95,	242,	5.450,	0.938,	0.077,	WK222
1.95,	239,	3.703,	0.880,	0.094,	WK223
1.95,	241,	3.823,	0.932,	0.167,	WK081
1.95,	237,	3.772,	0.833,	0.335,	WK023
1.95,	244,	2.960,	0.969,	0.397,	WK029
1.95,	238,	2.859,	0.847,	0.374,	WK173
1.95,	243,	2.630,	0.966,	0.375,	WK013
2.10,	256,	4.298,	1.516,	0.422,	WK020
2.10,	255,	3.918,	1.508,	0.099,	WK034
2.10,	257,	3.170,	1.531,	0.200,	WK236
2.10,	253,	5.696,	1.303,	0.139,	WK022
2.10,	254,	3.014,	1.320,	0.134,	WK224
2.10,	252,	4.237,	1.232,	0.212,	WK195
2.10,	249,	3.860,	1.147,	0.088,	WK215
2.10,	250,	3.495,	1.168,	0.230,	WK038
2.10,	251,	1.996,	1.196,	0.200,	WK063
2.10,	246,	5.592,	1.016,	0.243,	WK155
2.10,	248,	3.733,	1.119,	0.255,	WK044
2.10,	247,	2.672,	1.060,	0.196,	WK102
2.10,	245,	2.568,	0.999,	0.200,	WK207
2.10,	242,	5.450,	0.938,	0.077,	WK222
2.10,	239,	3.703,	0.880,	0.094,	WK223
2.10,	241,	3.823,	0.932,	0.167,	WK081
2.10,	237,	3.772,	0.833,	0.335,	WK023
2.10,	244,	2.960,	0.969,	0.397,	WK029
2.10,	238,	2.859,	0.847,	0.374,	WK173
2.10,	243,	2.630,	0.966,	0.375,	WK013
2.25,	256,	4.298,	1.516,	0.422,	WK020
2.25,	255,	3.918,	1.508,	0.099,	WK034
2.25,	257,	3.170,	1.531,	0.200,	WK236
2.25,	253,	5.696,	1.303,	0.139,	WK022
2.25,	254,	3.014,	1.320,	0.134,	WK224
2.25,	252,	4.237,	1.232,	0.212,	WK195
2.25,	249,	3.860,	1.147,	0.088,	WK215
2.25,	250,	3.495,	1.168,	0.230,	WK038
2.25,	251,	1.996,	1.196,	0.200,	WK063
2.25,	246,	5.592,	1.016,	0.243,	WK155
2.25,	248,	3.733,	1.119,	0.255,	WK044
2.25,	247,	2.672,	1.060,	0.196,	WK102
2.25,	245,	2.568,	0.999,	0.200,	WK207
2.25,	242,	5.450,	0.938,	0.077,	WK222
2.25,	239,	3.703,	0.880,	0.094,	WK223
2.25,	241,	3.823,	0.932,	0.167,	WK081
2.25,	237,	3.772,	0.833,	0.335,	WK023
2.25,	244,	2.960,	0.969,	0.397,	WK029

New Information Table - WK

Diff Level	Itm #	Parameter Est. A	B	C	Master Id
2.25,	238,	2.859,	0.847,	0.374,	WK173
2.25,	243,	2.630,	0.966,	0.375,	WK013
2.40,	256,	4.298,	1.516,	0.422,	WK020
2.40,	255,	3.918,	1.508,	0.099,	WK034
2.40,	257,	3.170,	1.531,	0.200,	WK236
2.40,	253,	5.696,	1.303,	0.139,	WK022
2.40,	254,	3.014,	1.320,	0.134,	WK224
2.40,	252,	4.237,	1.232,	0.212,	WK195
2.40,	249,	3.860,	1.147,	0.088,	WK215
2.40,	250,	3.495,	1.168,	0.230,	WK038
2.40,	251,	1.996,	1.196,	0.200,	WK063
2.40,	246,	5.592,	1.016,	0.243,	WK155
2.40,	248,	3.733,	1.119,	0.255,	WK044
2.40,	247,	2.672,	1.060,	0.196,	WK102
2.40,	245,	2.568,	0.999,	0.200,	WK207
2.40,	242,	5.450,	0.938,	0.077,	WK222
2.40,	239,	3.703,	0.880,	0.094,	WK223
2.40,	241,	3.823,	0.932,	0.167,	WK081
2.40,	237,	3.772,	0.833,	0.335,	WK023
2.40,	244,	2.960,	0.969,	0.397,	WK029
2.40,	238,	2.859,	0.847,	0.374,	WK173
2.40,	243,	2.630,	0.966,	0.375,	WK013
2.55,	256,	4.298,	1.516,	0.422,	WK020
2.55,	255,	3.918,	1.508,	0.099,	WK034
2.55,	257,	3.170,	1.531,	0.200,	WK236
2.55,	253,	5.696,	1.303,	0.139,	WK022
2.55,	254,	3.014,	1.320,	0.134,	WK224
2.55,	252,	4.237,	1.232,	0.212,	WK195
2.55,	249,	3.860,	1.147,	0.088,	WK215
2.55,	250,	3.495,	1.168,	0.230,	WK038
2.55,	251,	1.996,	1.196,	0.200,	WK063
2.55,	246,	5.592,	1.016,	0.243,	WK155
2.55,	248,	3.733,	1.119,	0.255,	WK044
2.55,	247,	2.672,	1.060,	0.196,	WK102
2.55,	245,	2.568,	0.999,	0.200,	WK207
2.55,	242,	5.450,	0.938,	0.077,	WK222
2.55,	239,	3.703,	0.880,	0.094,	WK223
2.55,	241,	3.823,	0.932,	0.167,	WK081
2.55,	237,	3.772,	0.833,	0.335,	WK023
2.55,	244,	2.960,	0.969,	0.397,	WK029
2.55,	238,	2.859,	0.847,	0.374,	WK173
2.55,	243,	2.630,	0.966,	0.375,	WK013

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
1,	1.708,	-1.215,	0.161,	AR001
2,	1.393,	-1.091,	0.137,	AR017
3,	1.731,	-1.051,	0.134,	AR005
4,	1.439,	-0.986,	0.107,	AR030
5,	1.318,	-0.980,	0.132,	AR021
6,	1.888,	-0.883,	0.113,	AR002
7,	1.602,	-0.875,	0.184,	AR020
8,	1.628,	-0.789,	0.200,	AR004
9,	1.823,	-0.770,	0.186,	AR003
10,	1.177,	-0.716,	0.134,	AR007
11,	1.313,	-0.708,	0.141,	AR210
12,	1.733,	-0.681,	0.132,	AR011
13,	1.695,	-0.561,	0.156,	AR006
14,	1.918,	-0.549,	0.070,	AR173
15,	1.397,	-0.543,	0.115,	AR211
16,	1.421,	-0.528,	0.089,	AR254
17,	1.473,	-0.508,	0.124,	AR031
18,	2.128,	-0.401,	0.189,	AR194
19,	1.774,	-0.392,	0.097,	AR158
20,	1.882,	-0.371,	0.115,	AR010
21,	1.704,	-0.349,	0.121,	AR212
22,	2.182,	-0.349,	0.127,	AR028
23,	1.953,	-0.344,	0.162,	AR271
24,	1.928,	-0.328,	0.081,	AR208
25,	1.982,	-0.324,	0.099,	AR252
26,	1.100,	-0.323,	0.145,	AR209
27,	1.439,	-0.296,	0.124,	AR269
28,	2.375,	-0.270,	0.095,	AR025
29,	1.621,	-0.228,	0.163,	AR195
30,	1.817,	-0.218,	0.097,	AR233
31,	2.178,	-0.132,	0.257,	AR066
32,	2.307,	-0.104,	0.108,	AR102
33,	1.499,	-0.084,	0.233,	AR262
34,	1.969,	-0.075,	0.200,	AR161
35,	2.859,	-0.058,	0.268,	AR137
36,	1.319,	-0.033,	0.222,	AR013
37,	1.349,	-0.007,	0.091,	AR236
38,	2.178,	0.023,	0.142,	AR215
39,	2.056,	0.027,	0.054,	AR105
40,	1.182,	0.027,	0.186,	AR019

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
41,	1.462,	0.034,	0.106,	AR067
42,	1.587,	0.049,	0.090,	AR024
43,	1.541,	0.090,	0.092,	AR012
44,	1.323,	0.108,	0.182,	AR058
45,	2.076,	0.116,	0.082,	AR237
46,	1.333,	0.116,	0.134,	AR139
47,	2.917,	0.119,	0.204,	AR238
48,	1.612,	0.126,	0.090,	AR083
49,	2.680,	0.137,	0.148,	AR104
50,	1.923,	0.153,	0.107,	AR213
51,	2.112,	0.156,	0.138,	AR234
52,	2.073,	0.166,	0.176,	AR217
53,	2.293,	0.183,	0.152,	AR016
54,	2.896,	0.192,	0.208,	AR125
55,	2.173,	0.234,	0.164,	AR036
56,	3.061,	0.262,	0.264,	AR235
57,	1.883,	0.271,	0.090,	AR145
58,	1.329,	0.280,	0.395,	AR270
59,	2.216,	0.308,	0.186,	AR222
60,	2.864,	0.311,	0.223,	AR052
61,	1.985,	0.325,	0.141,	AR126
62,	2.254,	0.326,	0.154,	AR047
63,	1.908,	0.327,	0.228,	AR273
64,	2.417,	0.333,	0.222,	AR035
65,	2.853,	0.339,	0.075,	AR227
66,	1.838,	0.344,	0.157,	AR239
67,	2.135,	0.363,	0.231,	AR029
68,	1.783,	0.370,	0.151,	AR103
69,	2.150,	0.411,	0.237,	AR157
70,	2.373,	0.423,	0.143,	AR175
71,	2.413,	0.424,	0.172,	AR256
72,	2.292,	0.430,	0.173,	AR240
73,	2.414,	0.430,	0.231,	AR197
74,	2.949,	0.434,	0.168,	AR228
75,	2.227,	0.434,	0.186,	AR034
76,	2.597,	0.452,	0.067,	AR220
77,	2.765,	0.453,	0.117,	AR179
78,	2.205,	0.456,	0.220,	AR272
79,	2.120,	0.456,	0.113,	AR261
80,	2.578,	0.475,	0.187,	AR088

Final Item Parameter Estimates

New Itm #	Item A	Parameters B	C	Master ID
81,	2.500,	0.483,	0.184,	AR219
82,	2.914,	0.483,	0.190,	AR156
83,	2.074,	0.489,	0.057,	AR253
84,	3.021,	0.492,	0.281,	AR048
85,	2.420,	0.503,	0.193,	AR053
86,	2.752,	0.507,	0.120,	AR018
87,	2.410,	0.518,	0.244,	AR255
88,	2.490,	0.519,	0.169,	AR216
89,	1.398,	0.535,	0.156,	AR037
90,	2.075,	0.539,	0.284,	AR023
91,	2.178,	0.542,	0.249,	AR042
92,	2.326,	0.544,	0.200,	AR122
93,	2.374,	0.545,	0.119,	AR201
94,	2.252,	0.548,	0.210,	AR085
95,	2.101,	0.552,	0.082,	AR198
96,	2.728,	0.562,	0.276,	AR242
97,	2.255,	0.583,	0.223,	AR221
98,	2.888,	0.593,	0.271,	AR196
99,	2.558,	0.609,	0.235,	AR199
100,	2.279,	0.612,	0.140,	AR041
101,	2.108,	0.619,	0.206,	AR054
102,	2.360,	0.641,	0.185,	AR274
103,	2.180,	0.641,	0.222,	AR069
104,	3.057,	0.649,	0.137,	AR009
105,	3.121,	0.653,	0.267,	AR039
106,	2.089,	0.654,	0.096,	AR226
107,	1.448,	0.663,	0.145,	AR180
108,	2.141,	0.679,	0.132,	AR059
109,	1.624,	0.680,	0.119,	AR218
110,	2.430,	0.684,	0.119,	AR143
111,	2.152,	0.705,	0.059,	AR275
112,	2.234,	0.708,	0.188,	AR043
113,	3.309,	0.711,	0.206,	AR128
114,	2.234,	0.715,	0.187,	AR147
115,	2.055,	0.718,	0.190,	AR257
116,	3.518,	0.740,	0.192,	AR243
117,	2.325,	0.742,	0.189,	AR141
118,	2.515,	0.746,	0.146,	AR092
119,	2.500,	0.750,	0.154,	AR160
120,	2.168,	0.758,	0.186,	AR022

Final Item Parameter Estimates

New Itm #	Item A	Parameters B	C	Master ID
121,	2.689,	0.764,	0.203,	AR110
122,	2.428,	0.769,	0.187,	AR075
123,	1.442,	0.793,	0.293,	AR214
124,	2.844,	0.810,	0.161,	AR108
125,	2.258,	0.817,	0.156,	AR115
126,	2.440,	0.819,	0.117,	AR182
127,	2.564,	0.834,	0.170,	AR057
128,	2.834,	0.834,	0.158,	AR140
129,	2.171,	0.847,	0.086,	AR245
130,	3.223,	0.847,	0.151,	AR200
131,	2.423,	0.855,	0.177,	AR244
132,	2.691,	0.856,	0.162,	AR049
133,	2.585,	0.860,	0.224,	AR178
134,	2.310,	0.861,	0.265,	AR246
135,	2.263,	0.863,	0.158,	AR045
136,	2.524,	0.882,	0.125,	AR142
137,	2.310,	0.909,	0.189,	AR223
138,	3.479,	0.909,	0.212,	AR159
139,	3.057,	0.916,	0.185,	AR068
140,	2.556,	0.920,	0.130,	AR183
141,	3.377,	0.920,	0.165,	AR098
142,	2.717,	0.940,	0.174,	AR144
143,	2.456,	0.944,	0.208,	AR094
144,	2.971,	0.953,	0.234,	AR258
145,	2.139,	0.958,	0.112,	AR100
146,	3.211,	0.974,	0.203,	AR250
147,	2.372,	0.979,	0.183,	AR091
148,	2.046,	1.001,	0.073,	AR188
149,	3.338,	1.013,	0.155,	AR186
150,	2.306,	1.017,	0.183,	AR165
151,	3.018,	1.027,	0.181,	AR263
152,	2.143,	1.039,	0.166,	AR097
153,	2.554,	1.039,	0.143,	AR138
154,	3.294,	1.054,	0.177,	AR247
155,	2.598,	1.060,	0.218,	AR230
156,	2.120,	1.062,	0.155,	AR109
157,	2.323,	1.063,	0.237,	AR151
158,	1.659,	1.069,	0.094,	AR232
159,	2.205,	1.077,	0.129,	AR131
160,	3.053,	1.078,	0.245,	AR224

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
161,	2.353,	1.086,	0.115,	AR176
162,	1.816,	1.089,	0.082,	AR169
163,	2.924,	1.107,	0.223,	AR229
164,	2.600,	1.112,	0.194,	AR130
165,	3.400,	1.115,	0.196,	AR038
166,	2.614,	1.124,	0.181,	AR192
167,	1.953,	1.140,	0.216,	AR118
168,	2.004,	1.146,	0.112,	AR202
169,	2.019,	1.152,	0.091,	AR040
170,	2.292,	1.155,	0.176,	AR133
171,	2.691,	1.162,	0.192,	AR191
172,	2.150,	1.165,	0.173,	AR231
173,	3.255,	1.178,	0.145,	AR167
174,	1.944,	1.181,	0.231,	AR166
175,	2.623,	1.192,	0.158,	AR187
176,	2.621,	1.194,	0.224,	AR259
177,	2.223,	1.198,	0.119,	AR032
178,	3.146,	1.200,	0.178,	AR264
179,	2.701,	1.203,	0.252,	AR015
180,	2.985,	1.211,	0.088,	AR149
181,	2.092,	1.223,	0.070,	AR111
182,	2.103,	1.238,	0.133,	AR071
183,	2.577,	1.244,	0.080,	AR081
184,	2.529,	1.257,	0.156,	AR014
185,	2.381,	1.259,	0.186,	AR026
186,	2.198,	1.274,	0.153,	AR116
187,	3.192,	1.277,	0.109,	AR099
188,	3.337,	1.280,	0.210,	AR114
189,	2.442,	1.293,	0.224,	AR168
190,	2.895,	1.298,	0.141,	AR101
191,	1.978,	1.299,	0.123,	AR089
192,	3.034,	1.306,	0.211,	AR074
193,	2.473,	1.308,	0.190,	AR135
194,	2.252,	1.318,	0.191,	AR190
195,	2.033,	1.324,	0.191,	AR249
196,	3.030,	1.328,	0.162,	AR120
197,	3.927,	1.340,	0.138,	AR046
198,	2.972,	1.342,	0.245,	AR077
199,	3.050,	1.369,	0.199,	AR070
200,	2.087,	1.379,	0.151,	AR119

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
201,	2.544,	1.382,	0.109,	AR206
202,	3.282,	1.386,	0.107,	AR076
203,	2.575,	1.400,	0.105,	AR205
204,	3.759,	1.402,	0.155,	AR096
205,	2.094,	1.421,	0.188,	AR148
206,	1.974,	1.424,	0.143,	AR203
207,	2.356,	1.445,	0.089,	AR123
208,	2.959,	1.455,	0.198,	AR080
209,	2.720,	1.460,	0.180,	AR064
210,	2.773,	1.475,	0.074,	AR207
211,	2.995,	1.478,	0.099,	AR171
212,	2.074,	1.482,	0.167,	AR113
213,	2.471,	1.494,	0.203,	AR061
214,	3.240,	1.500,	0.121,	AR184
215,	2.764,	1.502,	0.133,	AR134
216,	2.068,	1.506,	0.136,	AR072
217,	1.763,	1.513,	0.245,	AR008
218,	2.383,	1.526,	0.222,	AR163
219,	2.108,	1.530,	0.177,	AR063
220,	2.442,	1.530,	0.319,	AR174
221,	2.599,	1.533,	0.104,	AR172
222,	3.296,	1.533,	0.181,	AR193
223,	2.743,	1.538,	0.181,	AR033
224,	3.556,	1.543,	0.199,	AR082
225,	1.982,	1.559,	0.250,	AR044
226,	3.081,	1.560,	0.181,	AR204
227,	3.277,	1.579,	0.214,	AR106
228,	2.975,	1.581,	0.183,	AR267
229,	4.466,	1.591,	0.143,	AR090
230,	2.105,	1.607,	0.187,	AR027
231,	3.950,	1.608,	0.201,	AR155
232,	2.514,	1.610,	0.159,	AR079
233,	2.122,	1.627,	0.165,	AR095
234,	1.769,	1.632,	0.057,	AR056
235,	1.703,	1.644,	0.237,	AR189
236,	2.630,	1.649,	0.254,	AR117
237,	2.874,	1.671,	0.210,	AR093
238,	4.274,	1.672,	0.183,	AR152
239,	3.808,	1.691,	0.252,	AR251
240,	2.177,	1.694,	0.217,	AR065

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
241,	2.813,	1.704,	0.154,	AR060
242,	2.479,	1.709,	0.056,	AR051
243,	4.290,	1.728,	0.123,	AR170
244,	2.228,	1.731,	0.119,	AR136
245,	2.514,	1.756,	0.201,	AR078
246,	3.645,	1.762,	0.163,	AR084
247,	2.967,	1.769,	0.156,	AR177
248,	2.529,	1.812,	0.134,	AR107
249,	3.610,	1.816,	0.200,	AR153
250,	2.473,	1.823,	0.136,	AR087
251,	2.495,	1.839,	0.211,	AR127
252,	1.986,	1.877,	0.176,	AR268
253,	2.032,	1.884,	0.129,	AR062
254,	2.817,	1.924,	0.285,	AR265

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
1,	2.361,	-1.601,	0.157,	WK168
2,	1.998,	-1.581,	0.162,	WK176
3,	1.865,	-1.543,	0.166,	WK162
4,	2.653,	-1.514,	0.163,	WK115
5,	2.131,	-1.507,	0.170,	WK107
6,	2.833,	-1.467,	0.207,	WK191
7,	2.445,	-1.463,	0.172,	WK199
8,	2.173,	-1.454,	0.133,	WK181
9,	2.315,	-1.446,	0.231,	WK268
10,	2.199,	-1.420,	0.165,	WK050
11,	2.342,	-1.410,	0.160,	WK271
12,	2.120,	-1.383,	0.127,	WK175
13,	2.548,	-1.349,	0.117,	WK145
14,	2.582,	-1.342,	0.202,	WK059
15,	2.689,	-1.339,	0.177,	WK109
16,	2.371,	-1.285,	0.178,	WK192
17,	1.806,	-1.283,	0.186,	WK122
18,	2.433,	-1.279,	0.265,	WK066
19,	2.901,	-1.269,	0.154,	WK079
20,	1.701,	-1.268,	0.120,	WK103
21,	2.620,	-1.265,	0.135,	WK270
22,	2.272,	-1.260,	0.146,	WK180
23,	1.610,	-1.239,	0.188,	WK043
24,	2.559,	-1.204,	0.114,	WK106
25,	2.925,	-1.190,	0.195,	WK246
26,	2.836,	-1.182,	0.108,	WK252
27,	2.406,	-1.173,	0.168,	WK036
28,	2.615,	-1.169,	0.186,	WK028
29,	2.589,	-1.150,	0.168,	WK072
30,	2.286,	-1.141,	0.102,	WK160
31,	2.495,	-1.131,	0.168,	WK201
32,	2.323,	-1.127,	0.212,	WK126
33,	2.617,	-1.124,	0.144,	WK017
34,	2.253,	-1.117,	0.125,	WK012
35,	1.440,	-1.108,	0.132,	WK069
36,	3.002,	-1.084,	0.251,	WK087
37,	2.103,	-1.083,	0.154,	WK178
38,	1.796,	-1.063,	0.186,	WK154
39,	2.919,	-1.062,	0.312,	WK053
40,	3.628,	-1.041,	0.195,	WK260

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
41,	3.196,	-1.038,	0.114,	WK041
42,	2.381,	-1.014,	0.159,	WK061
43,	2.083,	-1.002,	0.130,	WK058
44,	3.403,	-0.999,	0.200,	WK183
45,	2.403,	-0.989,	0.131,	WK240
46,	2.328,	-0.985,	0.186,	WK077
47,	2.611,	-0.983,	0.220,	WK067
48,	2.829,	-0.971,	0.213,	WK238
49,	1.972,	-0.965,	0.145,	WK189
50,	2.389,	-0.948,	0.200,	WK105
51,	2.717,	-0.939,	0.229,	WK182
52,	2.636,	-0.926,	0.231,	WK124
53,	2.348,	-0.915,	0.145,	WK226
54,	2.653,	-0.910,	0.115,	WK143
55,	3.059,	-0.895,	0.192,	WK100
56,	4.277,	-0.892,	0.110,	WK137
57,	4.113,	-0.885,	0.200,	WK237
58,	2.284,	-0.874,	0.152,	WK057
59,	2.908,	-0.873,	0.133,	WK146
60,	4.756,	-0.868,	0.200,	WK004
61,	3.045,	-0.858,	0.145,	WK244
62,	2.679,	-0.857,	0.130,	WK242
63,	3.113,	-0.847,	0.285,	WK261
64,	3.660,	-0.845,	0.121,	WK263
65,	2.512,	-0.845,	0.200,	WK021
66,	1.965,	-0.831,	0.138,	WK009
67,	3.271,	-0.827,	0.209,	WK272
68,	5.770,	-0.820,	0.200,	WK167
69,	3.712,	-0.817,	0.252,	WK089
70,	2.647,	-0.817,	0.261,	WK119
71,	2.831,	-0.811,	0.339,	WK196
72,	3.865,	-0.811,	0.158,	WK225
73,	2.796,	-0.809,	0.200,	WK208
74,	3.408,	-0.765,	0.220,	WK024
75,	2.546,	-0.757,	0.149,	WK185
76,	3.224,	-0.755,	0.199,	WK027
77,	2.233,	-0.736,	0.200,	WK166
78,	3.532,	-0.714,	0.200,	WK269
79,	2.507,	-0.714,	0.169,	WK161
80,	1.870,	-0.713,	0.097,	WK243

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
81,	8.216,	-0.710,	0.200,	WK131
82,	2.401,	-0.709,	0.200,	WK157
83,	3.028,	-0.709,	0.200,	WK179
84,	2.537,	-0.693,	0.173,	WK127
85,	3.096,	-0.692,	0.205,	WK262
86,	3.018,	-0.688,	0.213,	WK056
87,	3.405,	-0.687,	0.285,	WK165
88,	2.730,	-0.671,	0.200,	WK198
89,	2.730,	-0.663,	0.189,	WK016
90,	2.168,	-0.644,	0.090,	WK054
91,	2.254,	-0.637,	0.185,	WK203
92,	4.881,	-0.630,	0.200,	WK266
93,	2.983,	-0.606,	0.159,	WK045
94,	2.854,	-0.606,	0.132,	WK190
95,	1.534,	-0.578,	0.131,	WK062
96,	2.373,	-0.575,	0.181,	WK259
97,	3.000,	-0.573,	0.187,	WK170
98,	1.839,	-0.565,	0.164,	WK052
99,	3.489,	-0.564,	0.200,	WK245
100,	4.011,	-0.542,	0.402,	WK150
101,	2.503,	-0.538,	0.253,	WK187
102,	1.556,	-0.535,	0.118,	WK212
103,	3.402,	-0.533,	0.209,	WK049
104,	8.592,	-0.532,	0.200,	WK033
105,	4.048,	-0.531,	0.187,	WK159
106,	3.604,	-0.528,	0.253,	WK205
107,	2.136,	-0.515,	0.248,	WK112
108,	1.611,	-0.507,	0.181,	WK080
109,	3.416,	-0.490,	0.145,	WK101
110,	2.967,	-0.489,	0.185,	WK018
111,	3.028,	-0.485,	0.219,	WK275
112,	3.911,	-0.474,	0.331,	WK134
113,	2.963,	-0.471,	0.120,	WK206
114,	3.246,	-0.463,	0.357,	WK085
115,	5.027,	-0.449,	0.200,	WK096
116,	4.062,	-0.436,	0.200,	WK076
117,	2.591,	-0.421,	0.230,	WK200
118,	1.637,	-0.413,	0.200,	WK075
119,	1.408,	-0.401,	0.200,	WK186
120,	2.926,	-0.399,	0.384,	WK005

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
121,	1.679,	-0.398,	0.137,	WK139
122,	4.522,	-0.392,	0.244,	WK265
123,	3.171,	-0.381,	0.304,	WK241
124,	4.110,	-0.379,	0.200,	WK188
125,	3.756,	-0.374,	0.223,	WK158
126,	2.589,	-0.367,	0.269,	WK008
127,	3.359,	-0.366,	0.202,	WK095
128,	3.480,	-0.362,	0.296,	WK149
129,	1.989,	-0.355,	0.167,	WK007
130,	3.746,	-0.319,	0.190,	WK152
131,	3.260,	-0.314,	0.203,	WK171
132,	3.337,	-0.297,	0.212,	WK211
133,	2.596,	-0.296,	0.208,	WK204
134,	2.238,	-0.290,	0.300,	WK184
135,	4.144,	-0.284,	0.200,	WK040
136,	3.443,	-0.279,	0.183,	WK229
137,	3.238,	-0.265,	0.281,	WK228
138,	4.358,	-0.259,	0.168,	WK227
139,	2.558,	-0.258,	0.266,	WK135
140,	4.460,	-0.249,	0.194,	WK113
141,	3.027,	-0.242,	0.247,	WK264
142,	2.809,	-0.240,	0.285,	WK118
143,	3.017,	-0.235,	0.200,	WK250
144,	2.959,	-0.229,	0.273,	WK082
145,	2.591,	-0.215,	0.259,	WK248
146,	1.507,	-0.206,	0.200,	WK078
147,	2.851,	-0.194,	0.200,	WK108
148,	2.478,	-0.166,	0.201,	WK046
149,	3.829,	-0.155,	0.357,	WK051
150,	6.527,	-0.155,	0.200,	WK086
151,	2.674,	-0.153,	0.161,	WK114
152,	3.156,	-0.153,	0.140,	WK025
153,	2.448,	-0.136,	0.193,	WK130
154,	3.338,	-0.101,	0.194,	WK230
155,	2.030,	-0.094,	0.100,	WK217
156,	2.543,	-0.088,	0.175,	WK064
157,	3.802,	-0.083,	0.229,	WK060
158,	2.874,	-0.070,	0.244,	WK273
159,	3.304,	-0.067,	0.200,	WK083
160,	2.901,	-0.063,	0.200,	WK068

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
161,	2.066,	-0.032,	0.193,	WK117
162,	2.999,	-0.009,	0.182,	WK239
163,	4.999,	-0.000,	0.260,	WK032
164,	4.066,	0.005,	0.215,	WK274
165,	4.135,	0.013,	0.200,	WK219
166,	5.282,	0.016,	0.200,	WK132
167,	3.802,	0.019,	0.298,	WK084
168,	5.460,	0.028,	0.308,	WK144
169,	3.386,	0.032,	0.217,	WK094
170,	2.400,	0.035,	0.163,	WK172
171,	3.143,	0.039,	0.175,	WK141
172,	5.042,	0.039,	0.158,	WK209
173,	3.352,	0.041,	0.152,	WK074
174,	3.566,	0.042,	0.312,	WK065
175,	2.562,	0.046,	0.137,	WK099
176,	2.892,	0.049,	0.152,	WK048
177,	2.900,	0.059,	0.177,	WK116
178,	3.352,	0.088,	0.222,	WK015
179,	2.546,	0.099,	0.198,	WK120
180,	2.934,	0.113,	0.200,	WK088
181,	1.620,	0.116,	0.137,	WK136
182,	1.939,	0.116,	0.303,	WK042
183,	2.868,	0.118,	0.362,	WK110
184,	5.167,	0.121,	0.200,	WK133
185,	4.381,	0.126,	0.200,	WK216
186,	2.123,	0.172,	0.200,	WK090
187,	4.376,	0.172,	0.297,	WK267
188,	2.703,	0.180,	0.230,	WK202
189,	2.169,	0.193,	0.120,	WK091
190,	2.037,	0.206,	0.129,	WK249
191,	2.967,	0.223,	0.235,	WK129
192,	1.064,	0.224,	0.200,	WK047
193,	1.246,	0.240,	0.200,	WK093
194,	5.259,	0.244,	0.324,	WK232
195,	3.369,	0.253,	0.202,	WK254
196,	1.747,	0.257,	0.221,	WK006
197,	2.104,	0.257,	0.151,	WK255
198,	1.025,	0.267,	0.200,	WK174
199,	3.399,	0.303,	0.299,	WK194
200,	3.477,	0.309,	0.094,	WK221

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
201,	2.790,	0.310,	0.244,	WK030
202,	1.645,	0.313,	0.176,	WK156
203,	3.372,	0.324,	0.200,	WK257
204,	2.755,	0.326,	0.165,	WK253
205,	1.999,	0.350,	0.137,	WK148
206,	2.686,	0.352,	0.175,	WK247
207,	4.202,	0.353,	0.200,	WK256
208,	3.863,	0.360,	0.199,	WK213
209,	3.419,	0.377,	0.361,	WK121
210,	4.740,	0.394,	0.245,	WK218
211,	2.519,	0.411,	0.271,	WK142
212,	3.067,	0.434,	0.200,	WK197
213,	4.262,	0.437,	0.275,	WK153
214,	2.793,	0.452,	0.200,	WK092
215,	3.642,	0.453,	0.209,	WK071
216,	1.389,	0.455,	0.123,	WK147
217,	2.311,	0.461,	0.387,	WK111
218,	1.777,	0.465,	0.117,	WK169
219,	1.902,	0.471,	0.280,	WK019
220,	3.880,	0.475,	0.131,	WK037
221,	3.096,	0.506,	0.226,	WK234
222,	3.341,	0.507,	0.290,	WK055
223,	2.629,	0.510,	0.192,	WK125
224,	5.655,	0.534,	0.178,	WK026
225,	4.058,	0.539,	0.165,	WK177
226,	6.325,	0.560,	0.288,	WK258
227,	4.550,	0.571,	0.164,	WK104
228,	3.874,	0.597,	0.087,	WK193
229,	3.892,	0.605,	0.152,	WK231
230,	3.464,	0.614,	0.191,	WK214
231,	3.868,	0.631,	0.181,	WK014
232,	2.440,	0.633,	0.200,	WK010
233,	2.375,	0.645,	0.200,	WK073
234,	2.423,	0.648,	0.198,	WK011
235,	4.745,	0.720,	0.289,	WK039
236,	3.492,	0.766,	0.242,	WK128
237,	3.772,	0.833,	0.335,	WK023
238,	2.859,	0.847,	0.374,	WK173
239,	3.703,	0.880,	0.094,	WK223
240,	1.958,	0.916,	0.203,	WK070

Final Item Parameter Estimates

New Itm #	Item Parameters A	B	C	Master ID
241,	3.823,	0.932,	0.167,	WK081
242,	5.450,	0.938,	0.077,	WK222
243,	2.630,	0.966,	0.375,	WK013
244,	2.960,	0.969,	0.397,	WK029
245,	2.568,	0.999,	0.200,	WK207
246,	5.592,	1.016,	0.243,	WK155
247,	2.672,	1.060,	0.196,	WK102
248,	3.733,	1.119,	0.255,	WK044
249,	3.860,	1.147,	0.088,	WK215
250,	3.495,	1.168,	0.230,	WK038
251,	1.996,	1.196,	0.200,	WK063
252,	4.237,	1.232,	0.212,	WK195
253,	5.696,	1.303,	0.139,	WK022
254,	3.014,	1.320,	0.134,	WK224
255,	3.918,	1.508,	0.099,	WK034
256,	4.298,	1.516,	0.422,	WK020
257,	3.170,	1.531,	0.200,	WK236